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STEEL

For forty-eight years — IRON TRADE REVIEW

February 26, 1931

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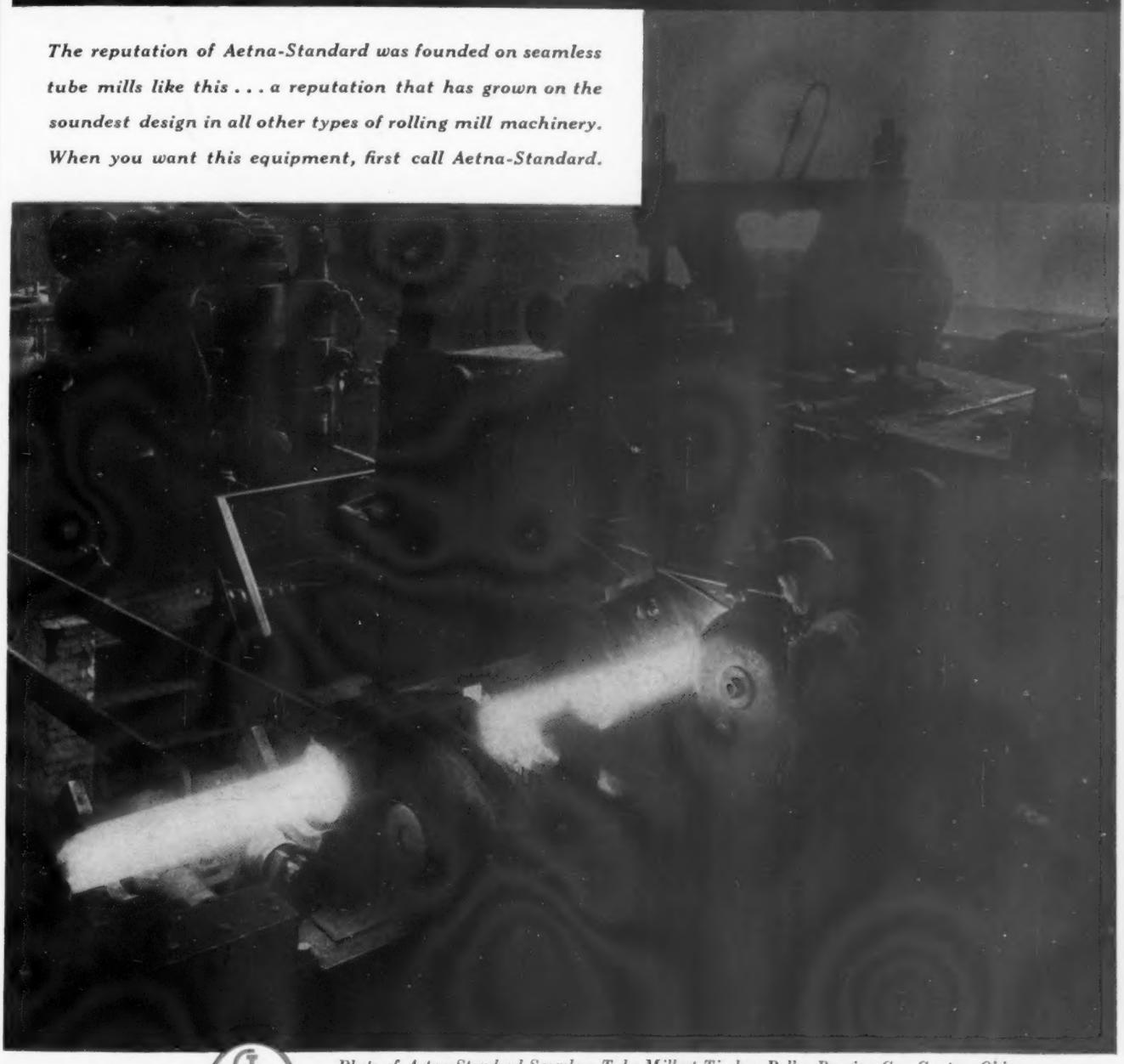
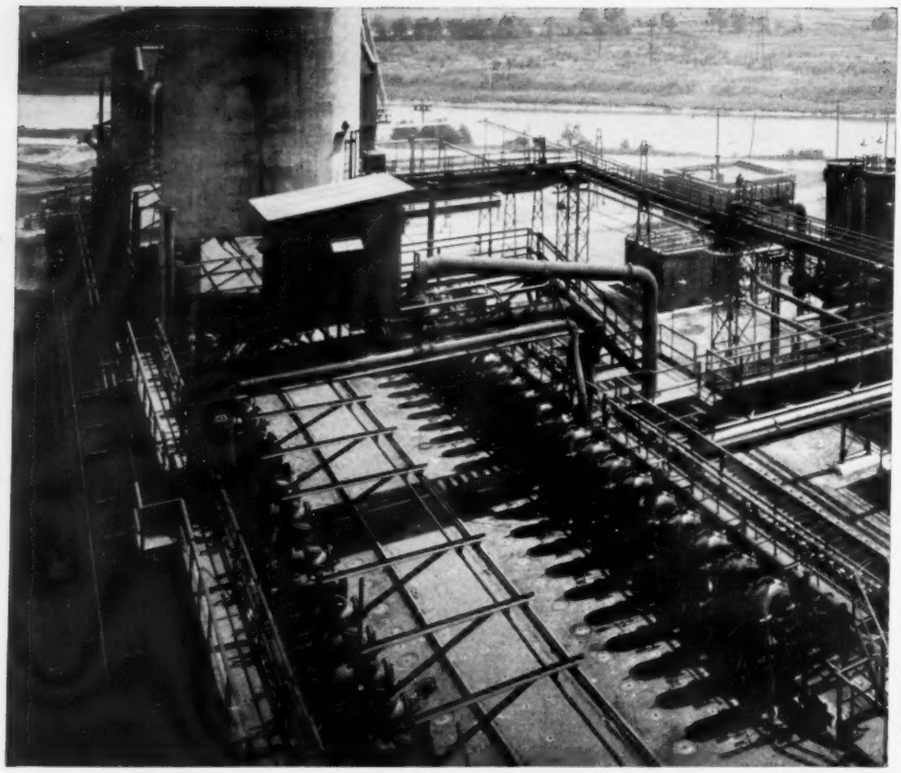
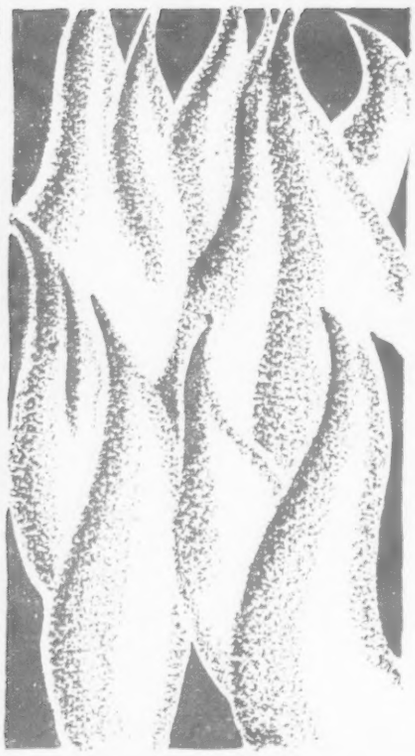


Photo of Aetna-Standard Seamless Tube Mill at Timken Roller Bearing Co., Canton, Ohio

Rolling Mill Machinery

The AETNA-STANDARD ENGINEERING CO., YOUNGSTOWN, OHIO





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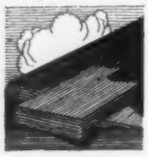

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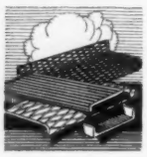

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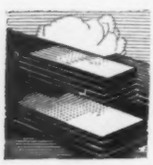
Flats, rounds, squares and hexagons in various analyses. Triple inspected for accuracy, straightness and finish.



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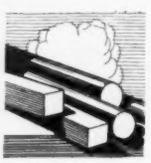
Allegheny Metal

—The unstaining, unrusting, untarnishing nickel chrome alloy that is being adopted for many purposes in all lines of industry. Large and complete stocks.



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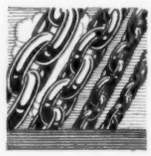

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Special rods adapted to welding the various materials and also equipment for both acetylene and electric arc welding.

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The range of kinds and sizes carried are too numerous to list. Stocks include practically all types of these and similar products.

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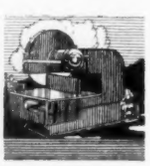
Five grades of Glyco Babbitt meet all bearing metal requirements. "Ryerson Guaranteed" solder is also stocked.



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STEEL-SERVICE

Volume 88 Number 9

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

WHEN the Romans designated the current month February it was to emphasize the observance of their feast of expiation and purification, but the iconoclastic steel industry spurns sackcloth and ashes. Rather, for it February is a period of spirited recovery, of exuberance, for in the twelve Februaries from 1919 to 1930 inclusive steel ingot production has increased eight times and pig iron nine. February this year unmistakably is consistent with this trend, so, like Caesar, steel approaches the Ides of March with little trepidation. The tradition of a March production gain over February is strong, surviving even the embarrassing letdown of last March.

Undoubtedly the state of business is the major topic of the steel industry today, overshadowing congress, mergers, Russia and manganese. Not only is there a broad underlying conviction that the trend line is projecting itself upward—even though in sawtooth fashion—but there is also the will to believe that conditions are improving. Steelmaking operations are closing February (Page 78) at about 53 per cent, five points above the beginning. Steel producers are sending up trial balloons on higher prices. The automobile industry is displaying something resembling its oldtime vigor. Even though the rising stock market bears some of the earmarks of professionalism, the effect is stimulating. It is probable that the industry is now laying day by day the foundation for improvement which will not be discerned in its entirety for thirty to sixty days.

Employers Should Beat Labor to the Draw

This quickening may rightly be considered the prelude to increased employment, and progressively there should be less distress, but one phase of the unemployment situation appears certain to recur, and that is employment insurance. Presumably, the present depression will pass without direct national or state enactments, but employers seemingly would be wise if they took time by the forelock. Organized labor is determined to press the matter, and if employers do not take the wind out of organized labor's sails they will be compelled to pay into state treasuries levies imposed on terms laid down by labor and disbursed by it.

Low Wages Connote Low Efficiency

Some far-seeing manufacturing units, and they are not necessarily the larger ones, already have acted. At Rochester, N. Y., a number of manufacturers have set up their own machinery and begun to collect (Page 17) their own funds, the levy being 2 per cent of each contributing member's payroll. . . . General Electric, which some months ago undertook to set up its own employment insurance fund (Page 18), in 1930 disbursed nearly $1,000,000 in pensions. . . .

Acme-P. & A. Photo

Although this building looks like a daylight manufacturing plant, it is a church at Dortmund, Prussia. It is almost entirely of steel and glass. The cross-tipped tower alone indicates its character.

Secretary of Commerce Lamont encouragingly states (Page 18) that lower wages being paid abroad are less a menace to American labor because of reduced efficiency.

Give Hoover Even Break on Vetoes

What has been known as President Hoover's executive chamber may have to be renamed his execution chamber before the week is out, but in another week—by noon of next Wednesday to be exact—congress will have adjourned and only a most extraordinary circumstance will convene congress before December. Everyone in Washington expects (Page 18) that the soldier bonus bill will be vetoed but repassed, while the Muscle Shoals bill will be vetoed and stay dead. . . . But a congressional recess will not mean that official Washington will hibernate. The tariff commission, getting ready to probe the cost of pens, copper, lead, fencing and other products, is already preparing to convert tariff ad valorem rates from foreign to domestic valuation (Page 18). . . . The shipping board is removing the final obstacle to construction of two superliners by the United States Lines.

Industrial Dial Shows Temperature Rising

The mercury in The Industrial Dial's thermometer (Page 27) has passed "poor" on the way up and four out of six important indicators record improvement in January over December. . . . The fact that leading eastern railroads plan to spend $600,000,000 on betterments (Page 15) in the next couple years is increasing warrant for confidence. . . . So is the disclosure that 400 trade associations in 1930 spent $6,650,000, or almost one-third of their total operating cost (Page 18) for advertising. . . . With business manifestly on the upgrade the decision of the Pennsylvania public service commission (Page 15) reducing short-haul freight rates in the Pittsburgh district is most timely. . . . Manganese continues a headline hunter (Page 15). A sulphur company plans to develop Cuban deposits, which are duty-free into the United States, while an Iron and Steel institute attorney reiterates domestic deposits are negligible. A treasury order Feb. 24 found no dumping of Russian manganese ore.

Building—the Nonstop Industry

Once, when secretary of commerce, Herbert Hoover was asked if there was any future for the building industry. "Man has not stopped building since the pyramids," was his rejoinder. This week's expanding market for steel is notably enhanced by the largest structural steel awards in 11 months (Page 68), including 40,000 tons for the Cincinnati Union Terminal. . . . But erecting buildings is only one phase of the building industry. In New York they tear down as many structures as they erect, and the old structural members, practically as good as new, frequently are used (Page 25) without reprocessing. . . . Listing the various materials which went into the construction (Page 92) of the giant Empire State building in New York is to enumerate more tonnage than many a small town uses in a year. . . . The Empire State building, incidentally, coined a new term for the strip industry—buck stock. It is hot strip, up to 30 inches wide, in long coils, from which ornamental window and door frames (Page 70) are fabricated.

No Private Life Left for Steel

When the metallurgists finally satisfy their curiosity, steel will have no more privacy than the proverbial goldfish. Discovery of a maze of minute cracks in heat-treated steel by the use of the high-power microscope prompted interesting conjecture at the annual meeting (Page 36) of the American Institute of Mining and Metallurgical Engineers. At this meeting blast furnace slags also were discussed intensively. . . . Metallurgists also have been probing further into tantalum carbide tipped cutting tools, first announced about a month ago, disclosing (Page 52) their practicability for machining operations. The carbide is brazed to tool shanks, and in a recent cutting test on S. A. E. 1050 steel with a cut of ½-inch, a feed of 0.020 inch and a speed of 170 feet per minute the tool showed little wear after three days of service. . . . Progress in the manufacture of steel castings has out-distanced the writing of specifications, with the result steel foundries are equipped (Page 41) today to turn out castings especially adapted to consumers' requirements and with properties exceeding handbook limits.

More Than Hollywood and Redwoods

Steel and its concomitants are a distinctly integral part of the business life of the Pacific coast—as important as its fruit and fisheries and movies. At the seventh annual conference of the iron, steel and allied industries of California a fortnight ago there gathered (Pages 16 and 17) some of the most solid citizens of that state. . . . Of the 160 exhibitors at the national western metal and machinery exposition at San Francisco (Page 46) many were companies operating exclusively on the west coast, and numerous others were coast representatives of eastern and middle western manufacturers. In two decades a substantial, almost self-sustaining industry has entrenched itself.

Bolts Respond to Heat-Treatment

Production of uniform and high quality bolts being the goal, a Cleveland manufacturer directed attention to the installation of modern heat treating furnaces and quenching apparatus both for bolts and for tools and dies used in bolt forming machinery (Page 31). Automatic and continuous features are noteworthy.

Pennsylvania Steel Shippers Win Lower Short-Haul Rates

PITTSBURGH district steel producers and consumers have won their fight for a reduction of the short-haul freight rates on iron and steel products instituted May 20, 1930. The Pennsylvania public service commission Feb. 23 directed railroads serving the Pittsburgh district to put into effect within 20 days a new scale calling for substantial reductions from the rates prevailing the past nine months.

The new setup, as in the case of the one now in effect, will be based on a sliding scale varying from a charge of 3 cents per 100 pounds for a distance of 5 miles and less to 16 cents for 100 miles and over 95. Shippers now are paying 6 cents per 100 pounds on shipments of less than 5 miles. In the case of many hauls over 10 miles in length slight reductions are shown in the proposed scale over the one prevailing prior to May 20, 1930.

Typical examples of the three schedules follow:

	(Cents per 100 pounds)		
Miles	Present	Proposed	Prior to 1930
5 and under	6	3	2.5
10 and over 5	6.5	3.75	3.5
20 and over 15	8	5.5	3.5
30 and over 25	9	6.5	7
40 and over 35	10	8	7 to 10.5

The figures shown above for the scale that was superseded last May are only approximate since these rates were not fixed on a definite mileage basis.

This decision is regarded as a notable victory in the Pittsburgh district, which had been faced with an additional yearly freight bill of about $2,000,000 as the result of the schedule now in effect. A similar increase in the Chicago district was suspended at the time of its institution, but an appeal to the public service commission was necessary in order to effect revisions at Pittsburgh.

The rates against which Pittsburgh shippers protested were part of the scale included in Docket No. 17,000, which effected a general revision on iron and steel freight rates in the territory east of the Mississippi and north of the Ohio and Potomac rivers. The Pittsburgh protest was directed only against the charges for short hauls to nearby consuming points.

Canada May Bar Soviet

At Ottawa, Ont., it is reported that the action of the United States in barring lumber and pulpwood imports from Russia unless importers prove they were produced by "free" labor is likely to be followed by a similar ban by the dominion government.

Railroad Programs Mean Outlay of $600,000,000

New York—Construction programs to be pushed shortly by eastern railroads will cost $600,000,000.

The New York Central program totals $250,000,000, some of the projects to be spread over four years. The West Side track development in New York will cost $150,000,000.

Pennsylvania is to spend $175,000,000 in 2½ years, the chief item being completion of electrification between New York and Washington. The road will purchase 150,000 tons of structural steel, 240 electric locomotives and electrify 80 passenger cars.

Other programs include $35,000,000 by the Baltimore & Ohio, $9,000,000 by the Lehigh Valley, $13,000,000 by the New Haven, $20,000,000 by the Erie, $15,000,000 each by the Nickel Plate and Pere Marquette, and $40,000,000 by the Chesapeake & Ohio.

No Dumping of Manganese

Washington — Secretary of the Treasury Mellon Feb. 24 issued an order formally stating that no dumping of manganese ore from Russia had been found. The preceding investigation followed a complaint from the American Manganese Producers association. This confirms the statement in STEEL of Feb. 5 to the effect no dumping had been found.

Freeport Texas To Produce Cuban Manganese Ore

New York—The Freeport Texas Co., 52 Wall street, has purchased a controlling interest in the Cuban American Manganese Corp., which owns extensive manganese deposits near Santiago, Cuba.

The Freeport company plans immediately to construct in Cuba a plant to treat 1000 tons of manganese ore daily by a patented process. That this is ultimate capacity is indicated by the further statement that the first year 100,000 tons of ore with a metallic manganese content of about 50 per cent will be beneficiated. This plant is to be in production within a year.

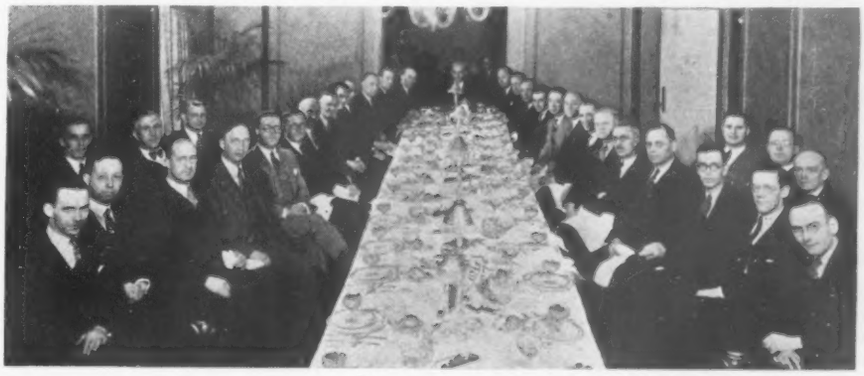
The minority interests in the Cuban American Manganese Corp. is represented by David M. Goodrich, chairman of the B. F. Goodrich Co., Akron, O.

There is no duty on Cuban ore.

Doubts Domestic Manganese

New York—"The truth is there is no high-grade manganese ore in this country that can be converted into ferromanganese," said Thomas J. Doherty, tariff counsel for the American Iron and Steel institute, in an interview with the *New York Herald Tribune*, Feb. 22.

Mr. Doherty characterized the acquisition by the Freeport Texas Co. of a controlling interest in the Cuban American Manganese Corp. as important, especially since under the treaty with Cuba manganese ore may be imported free of duty.



MORSE CHAIN SALESMEN READY FOR VIGOROUS CAMPAIGN

Closing a four-day sales convention at Ithaca, N. Y., and Detroit, salesmen for the Morse Chain Co., Ithaca, banqueted with officials of the Borg-Warner Corp., Chicago, of which the Morse company is a subsidiary. F. C. Thompson, vice president and general manager, calls the convention the most enthusiastic this group ever has held

Foresee Expansion of Steel Industry on Pacific Coast

PROGRESSIVE and constructive programs for industrial expansion in the manufacture and sale of iron and steel products on the Pacific Coast during 1931 were outlined and discussed at the seventh annual conference of the Iron, Steel and Allied Industries of California, held at Del Monte, Calif., Feb. 12-14.

Notes of optimism in the immediate business outlook were sounded by various speakers who addressed 180 of the leading iron and steel executives in attendance during the three-day program.

Addresses were presented by Fred L. Lipman, president, Wells Fargo Bank, San Francisco; E. O. Schreve, assistant vice president, General Electric Co., Schenectady, N. Y.; and Charles F. Abbott, executive director, American Institute of Steel Construction Inc., New York.

Important developments included resolutions unanimously adopted that pledged the conference to extend its work in simplified practice and standardization; to give preference to California-made goods, provided quality and price were equal; and to extend the important work of the traffic committee on obtaining freight reductions to and from California.

Of particular interest to the delegates was the decision to hold the next annual conference in Santa Barbara, Calif., Feb. 11-13, 1932.

At a meeting of the executive committee, officers and group committee men from both the southern and northern sections of the state were elected. R. M. Alvord, General Electric Co., San Francisco, who had served two years as vice-chairman was elected chairman to succeed J. E. Webster, chairman for the past two years. Other officers elected included vice president, E. Jungquist, Percival Steel & Supply Co., Los Angeles; and secretary, Chas. S. Knight, director, industrial department, California State Chamber of Commerce, San Francisco.

For Amendment to Code

The conference sanctioned an important recommendation—that the building code committee of the California State Chamber of Commerce be requested to have provision made in the uniform building code to cover the use of 27½-inch corrugated, or 30-inch flat sheets, as standard for the state.

Speaking on work done toward simplification and standardization, J. E. Webster, chairman, stated that the number of sizes of reinforcing steel bars had been reduced from 23 to 11. R. E. Fisher, vice-president, Pacific Gas & Electric Co., San Francisco, addressed the conference on "Natural Gas, a Factor in the Steel Industry," and told of the growth of the gas industry in the West, and the steps that were being taken to conserve this national resource. He pointed out that California manufacturers, who were each year in increasing numbers using more natural gas, could look forward to an abundant supply.

A summary of the remarks made by Charles F. Abbott in his address, "Profits in Co-operation," was presented on Page 27 of the Feb. 19 issuo of STEEL.

Chairmen of group committees for the northern and southern sections of the state for the coming year were elected, headquarters for the northern section chairmen being in San Francisco, and for the southern section chairmen in Los Angeles. They are as follows, the first mentioned being the northern section representative and the second the southern representative:

Purchasing agents—Hobart Mears, Matson Navigation Co.; and E. F. Watkins, Southern California Edison Co.

Foundries—C. P. Hoehn, Enterprise Foundry Co.; and C. B. Tibbets, Los Angeles Steel Casting Co.

Steel mills—William A. Ross, Columbia Steel Co.; and Arnold Foster, Pacific Coast Steel Co.

Structural steel—P. F. Gillespie, Judson-Pacific Co.; and E. P. Gohl, McClintic-Marshall Co.

Traffic—Henry Hofmann, Baker, Hamilton & Pacific Co.; and T. A. L. Loretz, Consolidated Steel Corp.

Reinforcing steel dealers—Charles M. Gunn, Gunn, Carle & Co.; and N. E. Dawson, Soule Steel Co.

Manufacturers—R. H. Petillon, Western Pipe & Steel Co.; and George J. Kuhrts Jr., Standard Boiler & Steel Works.

Merchant steel dealers—S. S. Barrows, Dunham, Carrigan & Hayden; and E. Jungquist, Percival Steel & Supply Co.

Seventh Annual Conference of the Iron, Steel and Allied

Unemployment Insurance—Compulsory or Voluntary?

FOURTEEN large manufacturing companies in Rochester, N. Y., have just made a joint agreement establishing a system of unemployment insurance, affecting about 26,000 employes. The companies include the Consolidated Machine Tool Co., Davenport Machine Tool Co., Yawman & Erbe Mfg. Co., Gleason Works, Vogt Mfg. Co., Cochrane-Bly Co., Sargent & Greenleaf Co., Taylor Instrument Co. and Eastman Kodak Co.

Each company agrees to make an appropriation annually beginning this year of an amount up to 2 per cent of its payroll until the the fund reaches a maximum equal to five annual appropriations. Benefits will not become payable until after Jan. 1, 1933. Then benefits for unemployment will be paid weekly at the rate of 60 per cent of the average weekly earnings of the unemployed person, with a maximum of $22.50 a week.

Employes do not contribute to this fund. This is one of the few and most conspicuous examples of a centralized group of employers undertaking to compensate employes for inability to provide them with work.

It is evident from this and many other current news reports that unemployment insurance is receiving more serious attention from employers. The number of bills introduced in state legislatures, and those in congress, providing for compulsory insurance is creating an important issue. Manufacturers are confronted with the threat of heavy taxation for this purpose, to raise funds to be administered by the state or federal governments, presumably in accordance with stringent "protective measures" suggested by trade union leaders.

The majority of these bills provide for a very limited contribution by employes, sufficient to give them a legal equity in the funds, and the remainder to be raised by assessments against employers and by general taxation for the public. Labor, however, would have equal representation with employers and states in administration.

Labor Suggests Regulations

Among other rules labor proposes is that when a worker skilled in one occupation is thrown out of employment he shall not be compelled to accept work in any other line than that for which he is skilled. A trade union workman could not be compelled to accept a "nonunion job," and a man unemployed could not be required to go more than 25 miles away from his home to accept work. These are only a few of the regulations that have been written into some of the bills now pending before the state legislatures.

Heretofore, efforts to compensate employes for idleness have been undertaken either by trade unions themselves, by unions and employers jointly, or by a few individual companies. The limited extent of the unemployment compensation movement in American industry is evident from the fact that during 1928 only 72 formal plans were in operation, covering less than one-half of 1 per cent of the country's wage earners.

The number of strictly trade union unemployment insurance plans is 37, the number of trade union-employer joint agreement plans is 22, and the number of company plans, operated and financed by management, is 14. The majority of the trade unions financing their own plans are in the printing industry, while by far the greater number of the union-employer co-operative plans are found in the clothing industry.

Only 35,000 workers come under the plans financed by unions, and 65,000 under the plans supported jointly by unions and employers. The number of workers for companies doing all or most of the financing was about 10,000 up to last year when the General Electric Co. put in effect, Dec. 1, its contributory plan, affecting 90,000.

In addition to these plans there are several, such as that adopted by the International Harvester Co., providing funds to loan to employes when they are laid off. Unemployment insurance has not been regarded seriously by the great majority of American industries and it is not found to any known extent in the iron and steel industry.

Prior to the present emergency no attempts were made in this country to include in such plans participation by state or federal governments; unemployment insurance never was a major political issue, and public sentiment has been and still is opposed to the out-and-out dole systems as in effect in Great Britain, Germany and eight smaller European countries, where in all 46,000,000 wage earners are eligible to doles.

Because state and federal insurance

Industries of California, at Del Monte, Calif., Feb. 12-14

systems are regarded as but one step removed from the dole system—wherein the employe himself contributes little or nothing to his support in case of unemployment, and because the dole system itself actually encourages idleness—such systems are being opposed by employers. As an example, a representative of a group of Cleveland employers recently protested to the state legislature against an insurance bill, which he said would cost Ohio employers $80,000,000 annually.

In Britain recent efforts to limit or discontinue the dole system have proved futile, and German employers are making strong efforts to abolish it. Recently Krupps offered guarantees against reduction of working hours for acceptance by workers of another wage rate cut, which would enable the company to return most of its workers and help to reabsorb the army of 5,000,000 jobless.

A quick return to normal prosperity in this country may relegate the issue of compulsory insurance, but there is evidence that companies will take the initiative as a safeguard. All unemployment insurance plans in this country are in an experimental stage; several have gone out of existence after a few years' time for lack of funds.

General Electric Pensions Nearly $1,000,000 in 1930

Nearly $1,000,000 was paid to pensioners by the General Electric Co., Schenectady, N. Y., during 1930, President Gerard Swope has announced. On Dec. 31 there were 1287 pensioners, averaging 69.20 eyars of age and having been employed by the company for an average of 28.77 years before retirement. Payments in 1929 totaled $739,126, and in 1928 $514,495.

Illinois Employment Lower

Chicago—January employment in Illinois industries, as reported to the state department of labor by 1369 establishments, declined 2.3 per cent from December. Wage earnings were reduced 3.4 per cent.

Merger Appeal Is Up as Court Prepares To Convene

Youngstown, O.—Probable date for the hearing of the appeal in the Bethlehem-Sheet & Tube merger injunction case is receiving attention as the circuit court of appeals is scheduled to convene in this city Monday, March 2. Attorneys in the case, believe the appeal will be formally brought to the attention of the court, comprising three members, and an effort made to have a date set for formal hearing. It is the understanding that some additional oral, and possibly documentary, testimony will be offered at the hearing, after which oral arguments will be presented.

The impression among attorneys is that the court faces about one month's work in this county as its docket now indicates. Two courses may be open. One is to assign the hearing to a certain date when the entire case may be presented. The other is to postpone the hearing until after the court has gone through its circuit of the component counties in this district, then to return to Youngstown in May or early June to hear the testimony and arguments before adjourning for the summer. The recent return of Newton D. Baker, of Sheet & Tube counsel, to this country will result in some definite course of legal action being outlined within a few days.

Rumors of More Steel Mergers Are Denied

Merger rumors of the past week, which are denied by important principals in each instance, are:

That Bethlehem Steel Corp., Youngstown Sheet & Tube Co., Republic Steel Corp. and Inland Steel Co. will be consolidated.

That the United States Steel Corp. is acquiring the A. M. Byers Co.

Advertising Comes First

Washington—A canvass of trade association work discloses that in 1930 trade promotion was carried on by 400 associations at a cost exceeding $22,000,000. The largest single expenditure was advertising, $6,653,351. Other expenditures included technical research $1,199,731, market research $306,360, publicity $763,728, field service $1,700,860, and systematized education $444,862.

Immigration Declines

New York—Gross total immigration to the United States in the fiscal year ending June 30 will not exceed 155,000 persons, according to the National Industrial Conference board, New York. This would be a decline of 87,000 persons from the year ended June 30, 1930.

The Business Week in Washington

PRESIDENT HOOVER has before him at present (Feb. 24) probably the two most important measures of this session of congress. The compromise bill on Muscle Shoals, providing for the operation of this federal project, seems destined to be vetoed; it may be held unsigned by the President and killed by a pocket veto or it may be returned with the President's "no" in which case the proponents lack sufficient votes to over-ride it.

The soldier bonus bill, increasing the loan value of certificates to 50 per cent but impossible of application for 6 months despite the statement it is for unemployment relief, is expected to be vetoed and repassed. It will necessitate the offering of federal bonds to the extent of $1,000,000,000.

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Internal revenue receipts for the first seven months of the fiscal year 1931 amounted to $1,473,923,000, a decline of $114,158,000 from the same period of 1930.

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Alexander Legge, chairman of the federal farm board, tells congressional committees he favors a temporary embargo of not more than one year on wheat and other agricultural products.

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Construction of two new superliners of the United States Lines will be continued at once, it is announced by the shipping board. The work had been held up because some dispute arose regarding the financing.

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The average amount of financing per automobile last year was 10 per cent less than in 1929, according to the bureau of the census, reflecting lower automobile prices during 1930 and a tendency toward the purchase of cheaper machines.

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The interstate commerce commission has formally dismissed the plans of the Great Northern and Northern Pacific railroads to consolidate their properties with the Chicago, Burlington & Quincy, at the request of the roads.

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The tariff commission has begun an investigation into costs of production of lead here and abroad. The commission probably will not make any recommendations with respect to rates of duty as a result of this investigation.

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Secretary of Commerce Lamont says it is doubtful whether low wages paid in American branch factories abroad are sufficiently small to offset the losses from reduced scale of operations, lower efficiency of labor and duplication of plant management.

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Work has been begun by experts of the tariff commission under section 340 of the present tariff law providing that a report must be submitted to congress not later than July 1, 1932, relative to the conversion of ad valorem rates, based on foreign valuation, to their equivalent rates on domestic valuation.

Mining and Metallurgical Engineers Elect Officers at Annual Meeting

ATTENDED by approximately 1700 engineers from various sections of the country, the 140th meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 16-19, was featured by numerous discussions of iron, steel and kindred subjects.

High spots of the meeting were addresses by Dr. F. F. Lucas, Bell Telephone Laboratories Inc., New York, who delivered the Howe Memorial lecture, "On the Art of Metallography"; and by Dr. Arne Fredrik Westgren, University of Stockholm, Stockholm, Sweden, who presented the Institute of Metals lecture, "X-Ray Determination of Alloy Equilibrium Diagrams." Further comment on these and other technical discussions at the meeting will be found on page 36 of this issue.

New officers of the American Institute of Mining and Metallurgical Engineers, chosen at the session, are: President, Robert E. Talley, vice president and general manager, United Verde Copper Co., Jerome, Ariz.; vice presidents, Howard N. Eavenson, mining engineer, Pittsburgh, and H. A. Guess, vice president and managing director, American Smelting & Refining Co., New York; directors, Louis S. Cates, vice president and general manager, Utah Copper Co., Salt Lake City, Utah; Karl Eilers, metallurgist, New York; S. R. Elliott, general superintendent, Cleveland-Cliffs Iron Co., Ishpeming, Mich.; H. G. Moulton, consulting mining engineer, New York; and William Wraith, executive, Inspiration Consolidated Copper Co., New York.

Officers Are Elected

Sam Tour, vice president, chemist and metallurgical engineer, Lucius Pitkin Inc., New York, was elected chairman of the Institute of Metals division. J. R. Freeman Jr., physicist, division of metallurgy, bureau of standards, Washington, and C. H. Mathewson, professor of metallurgy, Yale university, New Haven, Conn., were elected vice chairmen, William M. Corse, consulting metallurgist, Washington, was re-elected secretary-treasurer.

Four were elected to the executive committee of the Institute of Metals, For a three-year term: W. M. Peirce, research division, New Jersey Zinc Co., Palmerton, Pa.; A. J. Phillips, metallurgist, Scovill Mfg. Co., Waterbury, Conn.; and Guy C. Riddell, consulting engineer, New York. For a one-year term: Zay Jeffries, consulting metallurgist, of Cleveland.

The iron and steel division of the institute selected the following officers for the coming year: Chairman, F. M. Becket, vice president, Union Carbide & Carbon Co., New York; vice chairmen, C. B. Murray, partner, Crowell & Murray, Cleveland; W. E. Rudder, metallurgical engineer, General Electric Co., Schenectady, N. Y.; and F. N. Speller, metallurgical engineer, National Tube Co., Pittsburgh.

Elected to the executive committee of the iron and steel division for three years were: C. E. Meissner, development engineer, Chrome Steel Works, Carteret, N. J.; J. T. MacKenzie, metallurgist and chief chemist, American Cast Iron Pipe Co., Birmingham, Ala.; and G. B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology.

SWEDEN'S X-RAY AUTHORITY
Dr. Arne Frederik Westgren, professor of general and inorganic chemistry at the University of Stockholm, who presented the annual Institute of Metals lecture, "X-Ray Determination of Alloy Equilibrium Diagrams."

Dr. F. F. Lucas of the Bell Telephone Laboratories Inc., well known for his pioneering work in highgraphy, shown seated at the ultra violet microscope, one of his recent adaptations for examining metal surfaces at several thousand diameters magnification. Photograph by courtesy of the Bell Telephone Laboratories Inc.

January Steel Exports Less; Imports Hold

Exports of iron and steel products from the United States in January totaled 92,745 gross tons, 9243 tons less than in December. Principal products exported included scrap, plain structural shapes, skelp, black steel sheets and tin plate. Shipments to Canada totaled 41,491 tons. Imports during January totaled 40,781 tons, 27 tons more than in December. Pig iron was the chief product received.

For Higher Auto Duty

Officials of General Motors of Canada and Ford Motors of Canada, Ltd., operating the principal Canadian branches of United States automobile manufacturers, are said to endorse the new regulation greatly increasing the duty of American cars imported into Canada. The increased rate is aimed particularly at cars in the $1000 class, and on these the increased protection is about $127 per car.

Auto Output Up 10 Per Cent; Sheet Sales Off in January

AUTOMOBILE production in January showed a gain of approximately 16,000 units over December, 1930, which was entirely due to improvement in production of passenger cars, according to the department of commerce. Canadian total showed a slight gain. Monthly figures follow:

	—United States—			Canada
1930	Total*	Passenger cars*	Trucks*	Total
Jan.	273,218	235,226	37,025	10,388
Feb.	330,407	280,996	48,560	15,548
Mar.	396,384	331,973	62,990	20,730
Apr.	444,024	375,685	67,853	24,257
May	420,027	364,512	55,075	24,672
June	334,506	288,481	45,562	15,090
July	265,533	224,690	40,467	10,188
Aug.	224,368	185,619	38,363	9,792
Sept.	220,649	177,752	41,967	7,957
Oct.	154,401	115,476	38,343	4,541
Nov.	135,752	102,358	32,785	5,407
Dec.	155,601	122,645	31,531	5,622
(Year)	3,354,870	2,805,413	540,521	154,192
1931				
Jan.	171,903	139,814	31,577	6,496

*Revised for 1930.

Flat Rolled Steel Sales Declined in January

Average daily sales in January reported by members of the National Association of Flat Rolled Steel Manufacturers dropped 22 per cent from December. The total for January was 180,863 net tons. The December average was an increase of 75 per cent over November. Daily production in January increased 15 per cent over December. Total production for January was 167,865 tons. January's average daily shipments were 18 per cent higher than in December. January shipments totaled 170,379 tons. Unfilled tonnage Feb. 1 was 360,479 tons, compared with 378,601 tons Jan. 1.

Total sheet capacity for January was approximately 551,200 tons, and the capacity on which the foregoing report is based is 372,590 tons.

Coke Output in January in Slight Day Rate Gain

Total production of by-product coke in January was 3,092,153 net tons, an average of 99,747 tons daily, a slight improvement, but 26 per cent below January, 1930. One new by-product installation was placed in operation during the month, the Consolidated Gas Co. adding a battery of 37 Koppers ovens. A total of 88 plants operated in January at about 60 per cent of capacity, according to the department of commerce. A monthly comparison follows:

	(In net tons)		
	By-product	Beehive	Total
1930	coke	coke	coke
Jan.	4,195,674	320,200	4,515,874
1931			
Jan.	3,092,153	163,000	3,255,153

Foundry Equipment Orders Continue Upward

Index of foundry equipment orders gained for the second consecutive month when 17 members of the Foundry Equipment Manufacturers' association reported orders at an index of 65.3. This is the highest level since September of 1930. Index of unfilled orders at 94.6 for January was up 12 points from December. Index of gross orders follows by months:

	1931	1928	1929	1930
Jan.	65.3	132.7	180.5	160.1
Feb.		123.6	197.0	196.4
Mar.		138.6	209.4	164.1
Apr.		107.7	172.6	122.8
May		335.6	177.7	92.7
June		149.1	177.3	102.1
July		94.8	219.3	90.6
Aug.		278.0	229.5	85.2
Sept.		170.0	216.3	91.0
Oct.		185.0	245.3	50.0
Nov.		197.8	128.6	45.3
Dec.		166.5	208.0	59.8

Base: Average monthly shipments for 1922-23-24 taken as 100.

Financial News of Steel Industry

CONTINENTAL Shares, Inc., Cleveland, investment trust of which Cyrus S. Eaton is chairman of the executive committee and of the board of directors, reports its holdings in iron and steel companies as of Dec. 31, 1930, to be as follows: Republic Steel Corp., 209,409 common shares; Youngstown Sheet & Tube Co., 62,796 certificates of deposit, and 4100 shares unstamped; Wheeling Steel Corp., 3243 common shares; Cliffs Corp., 349,554 common shares and 508 voting trust certificates. Market value as of closing quotations on Dec. 31, 1930, totaled $42,715,013 for the above-named holdings.

Continental Shares reports income in form of dividends and interest for 1930 of $5,097,566 and net profit from the sale of securities was $1,924,498, aggregating $7,022,064, Interest and general expenses were $2,311,170. Preferred dividends in 1930 were $2,351,255 and common dividends paid or provided for were $2,348,671. Decline in market value of the company's securities as of Dec. 31, 1930 was $30,105,430 below the value of $147,899,348 carried in the balance sheet.

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Sharon Steel Hoop Co., Sharon, Pa., reports net loss of $752,803 in 1930, against net income of $1,341,215 in 1929.

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Baltimore Tube Co. Inc., Baltimore, reports net loss of $141,776 after all charges in 1930. This compares with net profit of $252,798 in 1929 .

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Superior Steel Corp., Pittsburgh, reports net loss of $258,924 for 1930, against net income of $72,919, or 63 cents a share, in 1929.

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Midvale Co., Philadelphia, reports net profit for 1930 of $1,403,728, equal to $7.01 per share. This compares with net of $1,368,033, or $6.84 a share in 1929.

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Electric Controller & Mfg. Co., Cleveland, reports net profit of $462,019, or $6.52 a share in 1930. This compares with earnings per share of $13.07 in 1929 and $6.31 in 1928.

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Dominion Engineering Co., Montreal, Que., reports profit after taxes of $557,252 in 1930. Depreciation charge-off was $397,252, dividends, $500,000, leaving a deficit for the year of $146,361.

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Westinghouse Air Brake Co., Wilmerding, Pa., reports net profit of $6,496,841 for 1930, after depreciation and federal taxes, equivalent taxes, equivalent to $2.05 a share. In 1929 the company had net of $8,822,711, or $2.78 a share.

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Allegheny Steel Co., Brackenridge, Pa., reports net earnings for 1930 of $1,610,292, as compared with $3,311,492 in 1929. After payment of $233,982 in dividends on preferred, earnings were equivalent to $2.25 per share on the outstanding common.

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Empire Steel Corp., Mansfield, O., will submit to stockholders, March 3, plan for authorization of $7,000,000 15-year 6 per cent first mortgage and refunding bonds, of which $1,780,000 will be offered to stockholders in units of one $100 bond and two shares of class B stock for $100. Present authorized 550,000 shares of no par common and 150,000 shares of 7 per cent preferred will be changed to 75,000 class A and 100,000 class B stock, both without par value. This plan will, in effect, reduce capital from $14,200,500 to $7,616,900. More working capital will be provided.

Industrial Men in the Day's News

Three New Vice Presidents of McClintic-Marshall Corp., Bethlehem, Pa.

Photo by Blank-Stoller Inc.

ELBERT A. GIBBS, just elected vice president in charge of production for McClintic-Marshall Corp., Bethlehem, Pa., successor to McClintic-Marshall Co., Pittsburgh, recently acquired by Bethlehem Steel Corp., has been with the organization since 1907. He then joined the estimating and designing department, becoming engineer in charge of the department one year later, and manager of erection for all operations west of Pittsburgh in 1910. After two years in World war service, attaining the rank of colonel in the American Expeditionary forces, Mr. Gibbs in 1919 was appointed general manager for McClintic-Marshall in charge of all fabricating and erecting, and in 1929 became vice president and general manager with the same duties. He attended the University of Minnesota in 1899 and was engaged in railroad engineering in the United States and Mexico from 1901 to 1903. In 1905 he was graduated in civil engineering from the University of California and for two years was instructor in civil engineering at Cornell university as a graduate student.

CHARLES M. DENISE, recently elected vice president in charge of the sales department of McClintic-Marshall Corp., with headquarters at Bethlehem, Pa., has had charge of the sales department of the McClintic-Marshall Co., Pittsburgh, since 1909. His experience, however, dates back to 1903 when he first became affiliated with the company. In 1904 he was placed in charge of its Chicago office, where he remained for 15 years, when he was transferred to Pittsburgh to supervise the entire sales or contracting department. Mr. Denise was graduated in 1895 from Rutgers college, and from a civil engineering course at Lehigh university in 1898. His career in the structural steel industry had its inception when he was employed by the Shiffler Bridge Co., Pittsburgh. He is a member of the American Society of Civil Engineers, as well as numerous clubs, including Duquesne club, Pittsburgh, University clubs, Pittsburgh and Chicago, Chicago Engineers' club, and Oakmont Country club, Oakmont, Pa. In 1926 Mr. Denise was elected second vice president of the American Institute of Steel Construction Inc., New York.

EARLE J. PATTERSON, vice president and treasurer of the McClintic-Marshall Co., Pittsburgh, since 1929 and for nearly 30 years identified with the financial department of that organization, will continue that association under the new regime. As noted in STEEL of Feb. 19, he has been elected vice president and treasurer of the McClintic-Marshall Corp., and he too will have headquarters in Bethlehem, Pa. Pittsburgh has been the scene of Mr. Patterson's entire industrial career. He is a native of that city and received his early education there. He commenced his connection with the McClintic-Marshall Co. in 1902 when he entered its employ as auditor. Eighteen years later or in 1920 he was elected treasurer of the company. Then in 1929 he was made vice president and treasurer in charge of financing. In this capacity he also had charge of financial affairs of the various subsidiaries of the McClintic-Marshall Co., serving in the capacity of treasurer of these organizations, including the Union Shipbuilding Co. and the Steel Frame House Co.

E. A. EMERSON, who started to work for the American Rolling Mill Co., Middletown, O., in vacations in 1904, has been elected president of the Armco International Corp., Middletown, O., which was organized in 1924 to handle all export business of the company. Upon his graduation from Cornell university in 1910 he became a member of American Rolling Mill Co.'s research division. In 1912 he was sent to Brazil to open the company's first branch export office in Rio de Janeiro and he has been engaged in export work since that time. Mr. Emerson serves as a member of the committee on foreign affairs of the United States chamber of commerce and is actively identified with other export organizations.

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E. G. Howell, Erman-Howell Co. Inc., Chicago, has been elected presi-

dent of the Chicago chapter of the Institute of Scrap Iron and Steel Inc., New York, succeeding Frank Parker. Other officers include: Vice presidents, Benjamin Kaplan, M. S. Kaplan Co., Chicago; I. Cohen, Cohen Iron & Metal Co., Milwaukee; and D. R. Cohen, D. R. & F. A. Cohen, Chicago; treasurer, Arthur Jeffery, president, Arthur L. Jeffery Co., Chicago; chairman of the executive committee, Walter I. Bregman, Price Iron & Steel Co., and secretary, H. M. Rosenthal, Briggs & Turivas Inc. The retiring president, Mr. Parker, and J. H. Turivas were elected to the executive committee.

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Orland F. Baughman, first vice president of Dickey-Grabler Co., Cleveland, metal stamping, etc., has been promoted to president, succeeding Albert H. Dickey, deceased.

Harry Rider of the Northern Ohio Lumber & Timber Co., was elected vice president of Dickey-Grabler, and Robert O. Bartholomew and W. L. Whitney were re-elected secretary and treasurer, respectively.

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H. W. Foulds, assistant to the president, Goulds Pumps Inc., Seneca Falls, N. Y., has been placed in charge of all sales work. He formerly was vice president for Servel Inc.

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Ernest J. Shaffer, Tulsa, Okla., recently was elected vice president and general manager of Central Tool Co., Shawnee, Okla. The company also maintains a tool repair shop at Oklahoma City, Okla.

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Alexander H. Legge, who has served as chairman of the federal farm board since July, 1929, will retire March 4 from that office to reassume the active presidency of the International Harvester Co., Chicago.

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O. C. Roberts has been appointed general manager of Peter Smith Stamping Co., Dearborn, Mich. J. R. Winter and Z. C. Wilkinson, former plant executives, have resigned.

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Phillip P. Brown, who as noted in STEEL of Feb. 5 resigned recently as vice president and general manager of the steel and warehouse department of the Wilkoff Co., Youngstown, O., has become affiliated with Friedman Bros. & Co. Inc., Cleveland.

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Dr. C. L. Dine, of Minster, O., has been elected president of St. Mary's Foundry Co., St. Marys, O.

Charles Dine, of St. Marys, was elected vice president and general manager, and J. W. Eiting, of Minster, secretary-treasurer.

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E. R. Wegener was recently elected president of Detroit Forging Co., Detroit. J. Farrand Williams is vice president and N. H. Macqueen is secretary-treasurer. These officers and S. Wells Utley, Kirke W. Connor and Fred Haskel comprise the board.

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Lee M. Clegg, sales manager for Thompson Products Inc., Cleveland, since 1927, has been appointed vice president in charge of sales. He became stock chaser for the company in 1918, and has risen by successive promotions.

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Richard F. Peterson, formerly secretary and treasurer of Van Zile Ventilating Corp., New York, will assume active control of the business in succession to the late Harry L. Van Zile, president of the company for many years, whose death was noted in STEEL of Jan. 22.

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H. W. Anderson was recently elected assistant secretary of Whitman & Barnes Inc., Detroit. Other officers re-elected for the current year are: William H. Eager, president, Karl Kendig, vice president and treasurer, and J. I. Holton, secretary. All directors were re-elected.

Augustus Wood

Who, as noted in STEEL of Feb. 19, has returned to the Niles Tool Works Co., Hamilton, O., as consulting engineer

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F. C. Engelhart has been elected president of Kester Solder Co. Chicago. He has been directing head of the company for 20 years, serving as general manager and treasurer.

J. A. Reitzel, formerly sales promotion manager has been elected general sales manager.

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George P. Torrence, vice president of Link-Belt Co. at Indianapolis, was recently re-elected first vice president of the Associated Employers of Indianapolis. Among the directors are O. B. Iles, head of International Machine Tool Co., Guy A. Wainwright, an official of Diamond Chain Co., Fred C. Gardner, treasurer of E. C. Atkins & Co., and J. S. Holliday, head of W. J. Holliday & Co. Inc., iron, steel and heavy hardware, all of Indianapolis.

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John E. Johnson, vice president and general manager of Muskegon Piston Ring Co., Muskegon, Mich., and L. W. Geistert of the investment firm of L. A. Geistert & Co., Grand Rapids, Mich., were elected directors of Sparta Foundry Co., Sparta, Mich. Other officers and electors were re-elected.

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Phil Huber, for two years factory manager for Ex-Cell-O Aircraft & Tool Corp., Detroit, has been promoted to vice president and assistant general manager. He was one of the founders of the original company in 1919. He became associated with the present organization in 1924 and was made factory manager in 1929.

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Gardner Abbott, Alfred J. Kroenke, president, F. G. Smith, vice president, J. A. Boyden, secretary, and Clifford E. Pierce, were elected directors Feb. 5 of Van Dorn Iron Works Co., Cleveland. M. J. Stout is assistant secretary, P. J. Christman is treasurer, and John M. Marshall is assistant treasurer.

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Clyde B. Mitchella for five years chief engineer of Republic Rubber Co., Youngstown, O., has been appointed general manager of Adamson Machine Co., Akron, O. Prior to his Youngstown work, he was in the engineering department of B. F. Goodrich Co., Akron. He received his technical education at Case School of Applied Science, Cleveland.

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J. A. Pelty, former assistant sales manager of Fairbanks, Morse & Co., Chicago, at Salt Lake City, Utah, and employed by the company for 25 years, has been appointed manager for that territory. He succeeds R. M. Murray, manager for three and one-half years, who has been appointed to take charge of the company's diesel engine department in San Francisco.

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J. M. McNeal, European sales manager of Landis Machine Co., Waynesboro, Pa., sailed Feb. 14 for England, after spending three weeks at the home office. His headquarters are at Birmingham, England, but he supervises the sale of the company's threading equipment throughout Great Britain and Europe. D. F. McLaughlin, also of Waynesboro, is associated with Mr. McNeal.

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David C. McKay was elected president, of the Leitelt Iron Works Grand Rapids, Mich., at the recent annual meeting. F. H. Meyer was elected vice president and general manager, Floyd V. Cederlund, secretary and Glenn W. Sackett, treasurer.

Obituaries

CLINTON. S. BRADLEY, 58, for the past six years general manager of sales of Jones & Laughlin Steel Corp. Pittsburgh, died unexpectedly Feb. 18. He had been associated with the corporation for nearly 30 years, 16 years of that period being spent as district manager at Buffalo. Born in Omaha, Nebr., Mr. Bradley received his early schooling in Akron, O. He started his industrial career as office boy with Akron Iron Co., but left Akron to go to the Boston branch office of the company where he remained until 1895, when he was transferred to Chicago as district representative. In 1897 he became affiliated with Whitman & Barnes Mfg. Co. manufacturer of machinists' supplies, as special New England representative, returning to Chicago two years later as vice president in charge of sales of the Sterion Copper Co., brass founder. Mr. Bradley became connected with the New York office of Jones & Laughlin Steel Co. in November, 1902, and in April, 1907, he was made district sales manager at Buffalo. On Nov. 1, 1923, he was appointed manager of the hot-rolled sales department and in January, 1925, he was promoted to general sales manager.

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John M. Paterson, secretary of the Lysaght Dominion Sheet Metal Corp., Hamilton, Ont., died there Feb. 6.

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Anthony Elsinghorst, 82, who for many years before he retired in 1911 was president of Elsinghorst Sheet Metal Co., Buffalo, died there Feb. 20.

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Philip L. Allison, a leading mechanical engineer of Canada, and an executive of the Canadian General Electric Co. for the past 27 years, died in his home in Peterboro, Ont.

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Adrian P. Sloan, 84, chairman of the board, Cushman Chuck Co., Hartford, Conn., and identified with the metal trade of that territory for more than 50 years, died Feb. 14.

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Willis E. Gray, former president of Rome Locomotive Works, Rome, N. Y., and builder of the first railroad in southern China, died Feb. 18 in his home in Westfield, N. Y., where he had resided since retirement.

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William J. Evans, 70, district agent at Pittsburgh for Titanium Alloy Mfg. Co., Niagara Falls, N. Y., died recently. He had been with the company 17 years. He entered the steel business with Lloyds in England about 50 years ago and in 1888 removed to this country to become identified with Park works of Crucible Steel Co. of America, Pittsburgh, where he remained for 19 years as open-hearth superintendent. For six years he was with the Alan Wood Iron & Steel Co., Conshohocken, Pa., and then became affiliated with the Titanium company.

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J. R. Haynes, 62, purchasing agent for the Chicago, Burlington & Quincy railroad, died Feb. 20 in Chicago. He had been assistant purchasing agent of the Burlington for more than 20 years prior to succeeding L. N. Hopkins, who resigned several years ago. Mr. Haynes was director of United States Rubber Co.

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John A. Nichols, 66, who retired April 1, 1927, as general superintendent of open-hearth and rolling mill

Clinton S. Bradley

departments of Corrigan, McKinney Steel Co., Cleveland, died Feb. 19. He was born at Ann Arbor, Mich., and prior to his 14-year service with the McKinney company, was open-hearth superintendent at Homestead works and then of Clairton works, Carnegie Steel Co., Pittsburgh.

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Winfield Scott Rogers, 77, one of the first manufacturers of ball bearings in this country, died recently at South Orange, N. J. Mr. Rogers established a plant in Boston in 1898 and later founded the Bantam Ball Bearing Co., Bantam, Conn. The company later moved to South Bend, Ind. Mr. Rogers retired as president of the Bantam company two years ago.

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Lothar R. Zifferer, 41, inventor of a type of expansion bolt, died in Columbia, Pa., Feb. 19. To manufacture and market his invention, he organized Standard Expansion Bolt Co., and later United States Expansion Bolt Co., Columbia. He also was president of Columbia Malleable Casting Corp., that city, as well as head of Canadian Expansion Bolt Co., and Hygeia Can Co., Utica, N. Y.

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William J. Patterson, 65, president of Heyl Patterson Inc., Pittsburgh, structural fabricator and builder of material handling equipment, died in that city Feb. 21.

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John G. Ladrick, 65, for 42 years identified with Cleveland Twist Drill Co., Cleveland, died Feb. 14 in Geneva, Switzerland. Born in that country, he came to the United States in 1883, settling at Hannibal, O. He later was employed by George Worthington Co., Cleveland, and then became affiliated with the Cleveland Twist Drill organization in 1889. For several years he sold its products in practically every section of the country. For 20 years, however, or until he retired last year, he represented the company west of the Rocky Mountains.

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Alexander Luchars, 77, who founded the Industrial Press, New York, 40 years ago, which publishes books and business papers, including *Machinery*, died at his home in Montclair, N. J., Feb. 19, after a 10-day illness of pneumonia. Mr. Luchars was born in Quincy, Mass., and after attending Massachusetts Institute of Technology joined the art staff of a New York newspaper. In 1891 he organized his own publishing company. He established the Machinery Publishing Co. Ltd., London, Eng., and a similar company in Paris.

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Robert A. McKean, 67, vice president of McClintic-Marshall Co., Pittsburgh, died there Feb. 18. Mr. McKean was associated with Riter-Conley Co. from 1888 to 1908, when he became manager of the Keystone plant of the Jones & Laughlin Steel Co. He left Jones & Laughlin in 1916 to become general manager of Riter-Conley plant of McClintic-Marshall Co., later becoming vice president of the company, in which capacity he served until his death. Notable work for which Mr. McKean was largely responsible include the Gary, Ind., blast furnace construction for United States Steel Corp., Jones & Laughlin furnaces at Aliquippa, Pa., and those of Colorado Fuel & Iron Co. at Pueblo, Colo.

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Thomas D. Thomas, 81, formerly an executive of the Hayden Foundry Co., Columbus, O., where he lived for the past 57 years, died Feb. 20. A native of Wales, he located in America at the age of 17 and lived for a time in New Jersey.

Here and There in Industry

HAMILTON STEEL CO., East 131st street and Taft avenue, Cleveland, recently organized, will serve as warehouse distributor for the following companies: Globe Steel Tube Co., Milwaukee, mechanical seamless tubing, boiler tubes, stainless steel tubes; Service Steel Co., Detroit, aircraft tubing; Weirton Steel Co., Weirton, W. Va., hot and cold rolled strip and sheets; Athenia Steel Co., Athenia, N. J., high carbon Swedish annealed and tempered spring steels; Jones & Laughlin Steel Corp., Pittsburgh, cold finished steel products. Stocks are now being arranged in the company's warehouse, which covers approximately 25,000 square feet.

H. K. Hamilton is president. Mr. Hamilton formerly was associated with Edgar T. Ward Sons Co. at Dayton, O., and at Cleveland. W. C. Thompson, formerly of Bourne-Fuller Co. is secretary, A. A. Lauer is superintendent and E. W. Smith is office manager.

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Chicago Forge & Pipe Co., Chicago, has appointed Moorlane Co., Tulsa, Okla., its distributor in Mid-Continent territory.

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Linde Air Products Co., New York, has established offices, display room and service station at 1421 North Broad street, Philadelphia.

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Meany Equipment Co., Portland, Oreg., has been appointed sales agent for the Pacific Iron & Steel Co., Tacoma, Wash., successor of the Lidgerwood-Pacific Co.,

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Combustioneer Inc., Goshen, Ind., manufacturer of stokers, has opened sales offices at 2212 Terminal building, Cleveland, in charge of James A. Thorsen.

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Hedges-Walsh-Weidner Co., Chattanooga, Tenn., manufacturer of power plant equipment, has opened a district sales office at 727 Mayo building, Tulsa, Okla., in charge of W. W. Boyd.

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Knowles Iron Works, Galveston, Tex., has acquired the Delta Boiler Scaling Co., New Orleans, La., and the latter's name has been changed to Knowles Iron Works of Louisiana.

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Parker Ice Machine Co., Los Angeles and San Berardino, Calif., has opened a sales office at 15 Moore street, New York, and will carry stocks at the Bush Terminal in Brooklyn.

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Allis-Chalmers Mfg. Co., Milwaukee, has established a factory branch at 42 East Gay street, Columbus, O., for sale and service of tractors and farm machinery. J. R. McKnight, formerly district manager at Fargo, N. D., is in charge.

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Dardelet Threadlock Corp., 120 Broadway, New York, has granted licenses for the manufacture of its self-locking screw thread to W. L. Brubaker & Bros. Co., Millersburg, Pa., and William H. Ottemiller Co., York, Pa.

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Fremont Foundry & Bearings Works, Oklahoma City, Okla., has changed its name to Fremont Foundry & Valve Works and has added a department for manufacture of oil field specialties. R. B. Fremont is president and manager.

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Victor Welding Equipment Co., San Francisco, and Kimball-Krogh Pump Co., Los Angeles, are considering terms of a merger under the name of Victor Equipment Co., with L. Stettner as president. The consolidation is to be made by exchange of stock.

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Viking Metal Co., Ridgway, Pa., a new industry about to begin operation there, has elected these officers: President, R. A. Cartwright; vice president and general manager, Earl Overholser; secretary, treasurer and sales manager, August W. Beckstrom.

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General Metalware Corp., Minneapolis, has been formed by the merger of the Northwestern Metalware Co., Minneapolis, Northwestern Metalware Co., Portland, Oreg., and the Dobbins Mfg. Co., North St. Paul, Minn. M. T. Bentzen is president, H. E. Brandt, vice president, A. H. Norberg, secretary and treasurer. Executive offices are to be at 1401 Central avenue.

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Tabor Mfg. Co., Philadelphia, manufacturer of molding machines, has bought the patents and goodwill of Titgen-Eastwood Co., also of Philadelphia, manufacturer of cupolas, pressure blowers, furnaces, sand blast and other foundry equipment. Personnel of the latter company is retained. Repairs and parts for the foundry equipment line formerly sold by the J. W. Paxson Co., will also be handled by the Tabor company.

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General Instrument Co., La Crosse, Wis., has been organized by interests formerly connected with the National Gauge & Equipment Co., now the La Crosse division of the Motometer Gauge & Equipment Co. It is starting production of automotive dashboard instruments, industrial thermometers and pressure gages. L. A. Corey is president, H. T. Owens vice president, R. L. Corey treasurer, and A. H. Zischke secretary and general manager.

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Illinois Testing Laboratories Inc., 141 West Austin avenue, Chicago, has appointed Ernest H. DuVivier, 30 Church street, New York, its representative in metropolitan New York and Northern New Jersey. F. W. Fernald, 335 Fifth avenue, Pittsburgh, has been made representative in western Pennsylvania and West Virginia. The company manufactures portable and stationary pyrometers, resistance thermometers and other industrial measuring instruments.

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H. A. Brassert & Co., Chicago, engineers and contractors, have been awarded a contract by the Wheeling Steel Corp., Wheeling, W. Va., for rebuilding its blast furnace at Portsmouth, O. In addition to remodeling the top, downcomers and primary dust catcher, gas cleaning equipment will be installed, including a cyclone washer, Brassert disintegrator and eliminator. Two stoves will be relined to give uniform velocity, with heating surface of 210,000 square feet. A new system of air mixers will be installed, controlled by Askania regulators.

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Bosshardt Steel Corp. has been organized at Canton, O., and has taken over the foundry of the former Canton Steel Foundry Co. The plant will be refitted and it is planned to install an open-hearth furnace to produce steel under the Bosshardt patents. L. J. Harley Jr. is president and general manager, E. A. McCuskey secretary, William B. Gschwend treasurer, W. J. Willis vice president and works manager. The board of directors is formed of these officers and the following: J. S. Blue, American Gas & Electric Co., New York; Fred J. Griffiths, president, Republic Research Corp., Massillon, O.; Thomas Towne, formerly sales manager, Union Drawn Steel Co., Beaver Falls, Pa.

Fairchild Aerial Surveys

BEAMS FROM BROADWAY

NEW YORK

MANY of the first skyscrapers erected in New York are coming down to make room for higher structures. More and more steel, which is found almost without exception to be in perfect condition, is being recovered from the wrecking process. Ultimately, of course, this steel finds its way to the scrap heap, but the razing process puts it to new use meanwhile.

Albert A. Volk demolishes about as many buildings as are erected in New York. Disposal of the steel recovered is one of the important divisions of the business. The Volk company has been selling annually close to 55,000 tons from wercked buildings.

Life of a structural beam after its primary purpose has been served is interesting. Sometimes it goes to the steel mill direct as scrap, appearing later as reinforcing bars. Again it is melted and rolled into new sections. But often it is put to further uses.

Old Beams Used Again

Such beams are utilized frequently as temporary supports, especially in subway construction, holding up busy highways while the work goes on underground. In such cases, the section is not refabricated. Some of the smaller iron shops are buyers of used shapes. They refabricate them and sections are again used in building.

Cost of handling, however, tends toward their increasing use as scrap. But the general idea that most, or all, of this material goes directly to scrap is erroneous. Dealers buying for such make lump sum bids for metal in wrecked buildings and it is often sorted for various requirements.

The Volk company is completing the wrecking of a building in Brooklyn in which 75 per cent of several thousand tons of steel recovered by the torches will be used again. Floor beams in this structure were set unusually close together. In some of the older steel frame buildings now coming down, more steel was used per square foot of space than is now the case. Oldtimers didn't have the confidence in steel versus wind pressure as is now the case.

This Is Bridge of Size

A large tonnage project which is steadily going forward is the Triboro bridge. This will connect three boroughs of New York City—Manhattan, Queens and the Bronx. Anchorages will be located on Randall's and Ward's islands in the East river and the bridge will pass over these two islands. There will be terminals in the three boroughs and ramps to and from Randall's Island.

The main bridge from Bronx to Queens will be 13,560 feet long. The Manhattan connection from the main bridge to East 125th street will be 4150 feet, making a total of 17,710 feet. Crossing at Hell Gate will be a suspension span 1380 feet long and 135 feet over mean water. At Little Hell Gate the crossing will be two steel arch spans each 375 feet long.

Two spans will carry the bridge over Bronx Kills, each 125 feet long, while a vertical lift, one span, 320 feet long, will cross the Harlem river. Approach spans in Manhattan, Bronx, Queens and on the East river islands will consist of granite-faced masonry arches, steel arches and viaducts. There will be eight lanes of traffic on the main bridge and six on the Manhattan connection. Plans are provided for an extra deck.

Recently another contract was let for the Ward Island anchorage. The bridge will cost close to $35,000,000 and will be completed in four years from June, 1930.

◆

Public schools in the five boroughs of New York City took 27,000 tons of structural steel last year. Higher educational building, private and parochial school structures, not included in the above total, would add several thousand more tons, notably the new Hunter College units. Practically all of this tonnage was included in new construction. New York's school building program calls for as much activity for 1931.

The bulk of this school tonnage is taken by four fabricators one of the four—Easton Structural Steel Co.—leading by a fairly wide margin. Schools are built on standardized plans, except in the case of some high schools. The two types most used call for tonnages of approximately 500 to 1000 tons respectively. Another standard plan was recently adopted which takes close to 1100 tons.

Schools Take Much Steel

In the past, school work has been delayed somewhat by abandoned contracts with the result that low bidders are now more closely investigated by the board of education. School proposals repeatedly bring out about the same group of bidders, contractors who specialize in this work.

The 1931 school construction schedule contemplates the erection of about 85 additional buildings in all five boroughs at an estimated cost of $65,000,000. However, this appears to be a bit ambitious in view of the fact that the program of last year is be-

(*Concluded on Page* 92)

EDITORIAL

Cut-Throat Competition—Then and Now

WHENEVER business slumps to low ebb the problems of cut-throat competition, price-cutting, etc., are brought out into the limelight for heated discussion in business circles. The subject has been aired frequently during the past year—so much so that it is easy to forget that the evils of competition, which disturb us so violently today, have been in evidence in practically every depression industry has known.

The vicious practice of unwarranted price-cutting was condemned in the dull days of the nineties as emphatically as it is attacked today. In glancing through the old files of *Iron Trade Review*, one finds references in 1906 and 1897 to conferences held for the purpose of controlling destructive price manipulation. It will be remembered that "pools" were formed in that period for the purpose of stabilizing prices. At one meeting, in which price agreements were under discussion, several leaders of the industry declared that nothing constructive could be accomplished until the organization was empowered to control production as well as prices.

The history of the pools at the close of the old century is strikingly parallel to that of European cartels in recent years. At times they seemed to be on the point of succeeding in accomplishing a measure of stability, but in the majority of cases they failed because the participants could not or would not learn to co-operate.

Discussion of Problems Is Revived in Periods of Depression

But in spite of the efforts of the early iron and steel industry to solve its problems by agreements within its own ranks, competition in the decade from 1890 to 1900 was hectic. Some of the battles for business in rails and wire were so bitter that selling prices dropped far below the cost of production. Many of the price wars of that period were destructive to a degree seldom if ever equaled in American industrial history.

Since that time, every business depression has witnessed a revival of the discussion of cut-throat competition, but with the passing of years the situation has improved gradually. The anti-trust laws put an end to "pools" and price and production control agreements. A more potent influence, however, was the gradual shifting of steel producing companies into the hands of executives who recognized the advantages of stabilization and who openly advocated the policy of "live and let live."

But while it is true that vast improvements have been made since the turn of the century, the problem of competition is still with us. Today it is largely a matter of education. The few offenders in the current situation present a far less difficult problem than that which existed 35 years ago. Open defiance and outspoken enmity which were rampant then do not exist today. The standards of business ethics are on a higher plane. The majority of executives possess a feeling of loyalty to their industry—a conviction that what is good for the group is good for the individual unit.

Solution Through Education Nearer as Spirit of Co-operation Gains

Hope for the ultimate solution of the problem lies largely in this spirit of co-operation, which has been gaining strength since the birth of the industry. When the heads of the important companies learn to act individually for the benefit of the industry as a whole (as they did, for instance, in adhering to the policy of maintaining wage rates in the face of a serious decline in income) there is hope that they may act constructively in the matter of price.

Nor is it necessary for industry to wait for a change in the anti-trust laws before it can solve the problem of destructive competition. Solution does not involve agreement on price, production or any other quantitative factor. It means merely the acceptance by all parties of the policy of selling at a profit—or, to state it negatively, of refusing to cut the price below the cost of production for the purpose of getting the business away from a competitor who can make a profit on it.

It is not an easy problem, but we are much nearer a solution today than at any time in the history of the steel industry. The challenge for remedial action is especially strong at this moment, because steel producers and fabricators are passing through a period of low prices and restricted demand, in which it is desirable to eliminate every wasteful practice.

What does it profit a manufacturer if he operates his equipment at a high rate of efficiency and dissipates all of the advantage thus gained in needless and demoralizing price concessions?

THE INDUSTRIAL DIAL

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The Business Trend Section of STEEL

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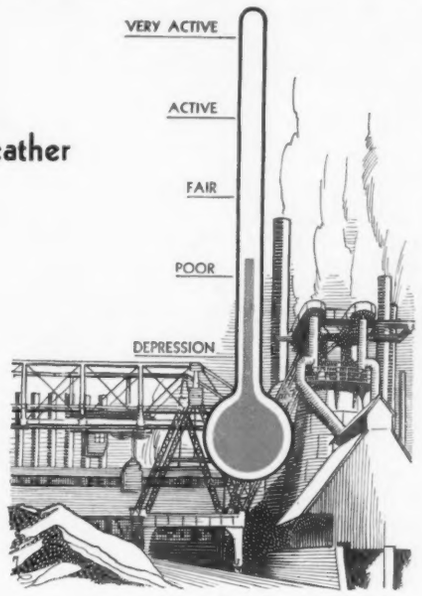
NOW that the statistical record for January is practically complete, it is evident that seasonal influences in that month lifted the majority of barometers of industrial activity safely above December levels. The moderate improvement in the first month of the new year was achieved in the face of discouraging fourth-quarter earnings statements, record-breaking commercial failures, irregular stock market activity and continued declines in commodity prices.

These mixed factors were reflected in the business sentiment which prevailed throughout January. Producers, distributors and consumers proceeded with extreme caution. But before the month ended, signs of improvement were sufficiently abundant to pave the way for a new note of confidence—which has gained impetus in each successive week of February.



Activity

Chief among the factors responsible for this first trace of returning confidence was the January record of iron and steel output. Steel ingot production at 46 per cent of capacity as compared with 38 in December, a gain of 2.8 per cent in pig iron output, a fair increase in freight traffic and a slight spurt in automobile manufacturing were convincing indications of the upward turn in industrial activity.

Price

Commodity prices continued to decline fractionally during January, although evidences of increasing stability began to accumulate. Bradstreet's dropped from $9.51 on Jan. 1 to $9.31 on Feb. 1. STEEL's composite of steel and iron prices, standing at $31.66 at the beginning of the year, advanced to $31.73 on Jan. 14 but dropped back to $31.69 Feb. 4 and on Feb. 18 dropped to $31.61, a new alltime low point.

Where Business Stands

Monthly average 1930 = 100

	Jan. 1931	Dec. 1930	Jan. 1930
Steel ingot production	72.1	60.6	110.3
Pig iron production	64.1	62.4	106.3
Freight movement	79.4	79.2	96.6
Building construction	57.9	68.3	77.4
Automobile output	60.7	55.1	97.0
Wholesale prices	88.5	91.5	108.7

Demand

It is significant that the improvement in industrial activity has been due to a slightly expanding demand from many sources rather than from marked increases from the important consuming groups. Aside from orders for rails and other track material, the railroads did not figure importantly in steel purchases. The increased commitments of the automobile, building and petroleum industries were not impressive. But the fact remains production has gained steadily without spectacular help from these leading groups. And there is encouragement in this feature of January's record.

Business Trend Charts of the Month

Production

Steel ingot production ..... Feb. 12, p.27
Pig iron production ..... Feb. 12, p.29
Blast furnace production rate ..... Feb. 12, p.28
Industrial production ..... Feb. 5, p.38
Coke output ..... Feb. 5, p.40

Demand

Unfilled orders, U. S. Steel Corp. ..... Feb. 19, p.29
Railroad car orders ..... Feb. 19, p.30
Index of machine tool orders ..... Feb. 19, p.31
Foreign trade ..... Feb. 26, p.30
Building construction ..... Feb. 26, p.29
Automobile output ..... Feb. 5, p.40
Steel sheets ..... Feb. 26, p.29
Steel castings ..... Feb. 5, p.39
Structural steel sales ..... Feb. 5, p.41

Prices

Bradstreet's index ..... Feb. 19, p.30
Iron and steel price index ..... Feb. 19, p.33
Foundry pig iron prices ..... Feb. 12, p.28
Iron and steel price parity ..... Feb. 12, p.29
Basic iron—heavy melting steel ..... Feb. 12, p.30

Miscellaneous

Freight traffic ..... Feb. 5, p.41; Feb. 19, p.31
Industrial production ..... Feb. 5, p.38
Commercial failures ..... Feb. 12, p.30
Refined copper ..... Feb. 19, p.33
Railroad earnings ..... Feb. 26, p.30
Earnings, U. S. Steel Corp. ..... Feb. 5, p.39

Thumb Nail Sketches of Business

Blast Furnace Activity

Blast furnace output in January turned upward for the first time in eight months. Whereas 95 of 310 stacks were active on Dec. 31, a total of 102 of 309 available units were in blast on Jan. 31. The gain of 7 stacks resulted from the blowing in of 12 furnaces and the blowing out of five.

Unfilled Steel Orders

Unfilled bookings of the United States Steel Corp. on Jan. 31 were 4,132,351 tons, a gain of 4.8 per cent over orders as of Dec. 31. This was the fourth consecutive gain. Orders on Jan. 31, 1930 were 4,468,710 tons.

Automobile Production

Motor car manufacturers are increasing their schedules slowly and cautiously. January production, estimated at 177,400 units, was about 10 per cent above that of December. The total in February should be around 200,000 cars, since the weekly totals have exceeded 50,000. However, in January, 1930 weekly output was ranging at about 80,000.

Employment

According to the Federal Reserve Board, the index of factory employment declined from 78.8 in December to 76.4 in January. Adjusted for seasonal variations the drop was from 80.1 to 78.3. In New York state factory employment in January declined 2.5 per cent. In Cleveland employment gained 2.2 per cent in January. Detroit factory employment gained sharply in three weeks of January and then slipped off slightly, the average for the month showing little change from that of December.. The trend thus far in February would indicate a moderate gain in employment in that month.

Industrial Production

Federal Reserve board's index of industrial production for January is 82 (preliminary) as against 78 in December. Adjusted for seasonal variation the index stands at 82 in both months. Activity in minerals declined, while that in manufactures slightly more than held its own.

Commodity Prices

Bradstreet's commodity price index for Feb. 1 was $9.3087, the lowest since 1915. The decline from the Jan. 1 level of $9.5082 represents the sixteenth consecutive drop in the index. During the month of January, prices of 15 commodities increased, prices of 29 commodities decreased and prices of 62 commodities remained unchanged.

Agriculture

The outlook for agriculture, which at the turn of the year was decidedly uncertain, has not been clarified since that time. The grain markets are subjected to cross-current influences, which are confusing. Too much rain in South America, not enough rain in parts of the United States and Canada, and conjectures as to the role of Russia are factors in the wheat situation. In general the trend of prices of agricultural products continues downward, the situation on the farms has not changed appreciably and the outlook for the future awaits spring developments before definite predictions can be made.

The Barometer of Business

Industrial Indicators

	January 1931	December 1930	January 1930
Pig iron output (Daily average, tons)	55,255	53,732	91,573
Machine Tool Index	65.3	73.1	175.4
Unfilled orders (tons)	4,132,351	3,943,596	4,468,710
Ingot output (Daily average, tons)	91,971	77,222	140,596
Dodge Bldg., awards in 37 states (sq. ft.)	24,634,000	29,054,600	32,920,000
Automobile output	177,400*	161,223	283,606
Coal output, tons	38,542,000	39,716,000	49,778,000
Business failures; number	3,316	2,525	2,759
Business failures; liabilities	$94,608,212	$83,683,361	$61,190,000
Cement production, Bbls.	6,581,000	8,480,000	8,498,000
Cotton consumption, bales	454,188	406,207	577,235
Car loadings (weekly average)	698,108	695,961	849,311

*Estimated.

Financial Indicators

	January 1931	December 1930	January 1930
25 Industrial stocks	$215.03	$210.85	$290.55
25 Rail stocks	$88.63	$81.27	$125.88
40 Bonds	$85.00	$82.32	$86.88
Bank clearings (000 omitted)	$39,310,138	$41,871,884	$49,942,765
Commercial paper rate (N. Y., per cent)	2¾	2¾	5
*Commercial loans (000 omitted)	$8,374,000	$8,449,000	$8,995,000
Federal Reserve ratio, per cent	76.3	79.2	72.9
Railroad earnings**	$49,371,769	$62,069,000	$72,227,197
Stock sales, N. Y. stock exchange	52,543,000	58,764,602	62,308,000
Bond sales, par value	$264,117,000	$265,762,000	$209,375,000

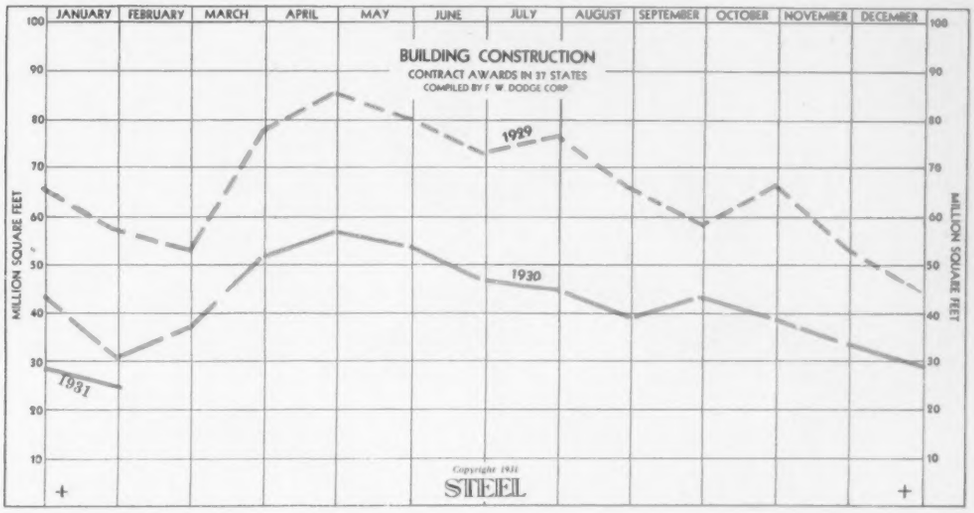
*Leading member banks Federal Reserve System.
**December, November and December, respectively.

Foreign Trade

	January 1931	December 1930	January 1930
Exports	$250,000,000	$273,000,000	$411,314,000
Imports	$183,000,000	$209,000,000	$310,987,000
Gold exports	$54,000	$36,000	$8,948,000
Gold imports	$34,426,000	$32,778,000	$12,908,000

Commodity Prices

	Jan. 1931	Dec. 1930	Jan. 1930	Monthly Average 1913
STEEL's composite average of 14 iron and steel prices	$31.71	$31.74	$35.56	$26.32
Bradstreet's index	$9.31	$9.51	$11.51	100
Wheat, cash (bushel)	99c	99c	$1.41	92c
Corn, cash (bushel)	85½c	88c	$1.05	51c
Petroleum, crude (Bbl.)	92c	92c	$1.40	$2.50



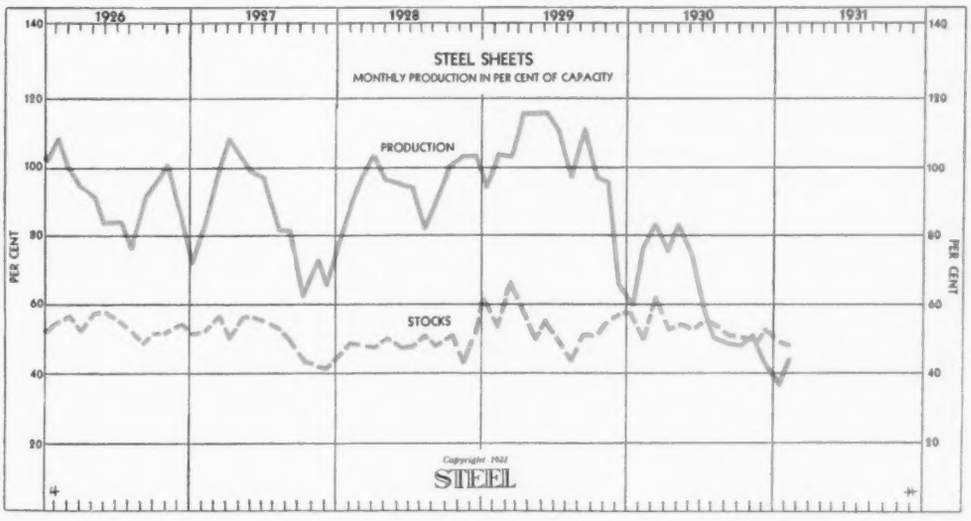
	Square Feet
January, 1931	24,634,900
December, 1930	29,054,600
January, 1930	32,920,000

Construction Awards Continue Decline During January

Building contracts awarded in 37 eastern states in January, according to the F. W. Dodge Corp., were for 24,634,900 square feet of floor space, which was a continuance of the decline in building activity and the lowest monthly figure for several years. Activity in residential construction accounted for approximately half of the contracts, or 12,235,100 square feet. Industrial building amounted to 1,634,900 square feet. In the previous month 14,704,900 square feet for residence building and 2,162,800 square feet for industrial purposes were a part of the total of 29,054,600 square feet awarded. Except for a very slight increase in September, construction awards have declined markedly and steadily since last April.

Output of Steel Sheets Turns Upward, Stocks Decrease

Production of steel sheets during January turned upward from 39.8 per cent, which had been the lowest rate for several years, to 45.1 per cent. The increase was made in the face of a drop in sales from 63.9 per cent of capacity to 48.6 per cent. Sales, however, except for December, were the best since September. Stocks, instead of gaining through increased production, fell from 50.6 per cent to 48.4 per cent. A responsible factor was a moderate increase in shipments. The latter caused unfilled orders to drop correspondingly, so that the tonnage, 360,479, is slightly under a month's output at full capacity. A year ago production was at 77.6 per cent of capacity and stocks at that time were at 51.0 per cent.



Production
Per cent of capacity

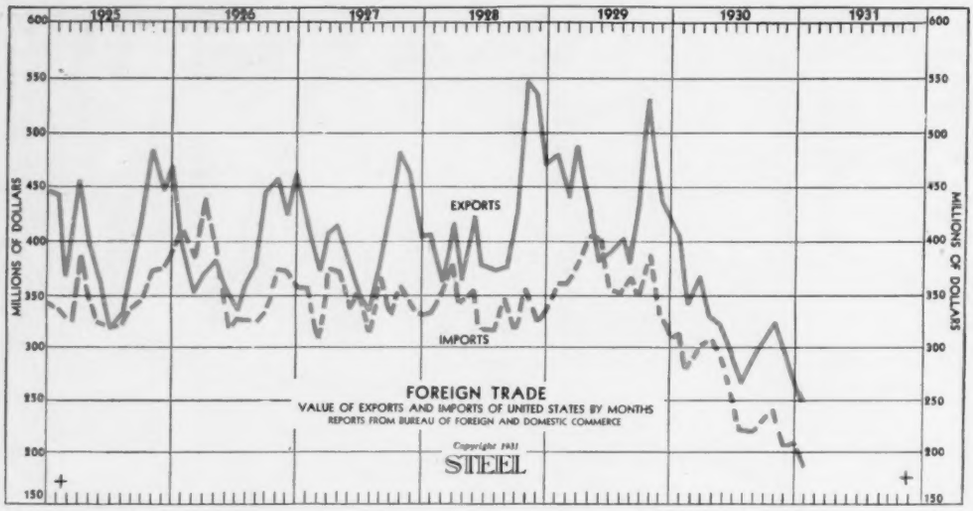
	1931	1930
January	45.1	77.6

	1930	1929
December	39.8	60.0
November	43.6	65.8
October	50.6	95.3

Stocks
Per cent of capacity

	1931	1930
January	48.4	51.0

	1930	1929
December	50.6	57.3
November	54.1	57.6
October	49.4	50.5



EXPORTS	
January, 1931	$250,000,000
December, 1930	273,000,000
January, 1930	411,314,000

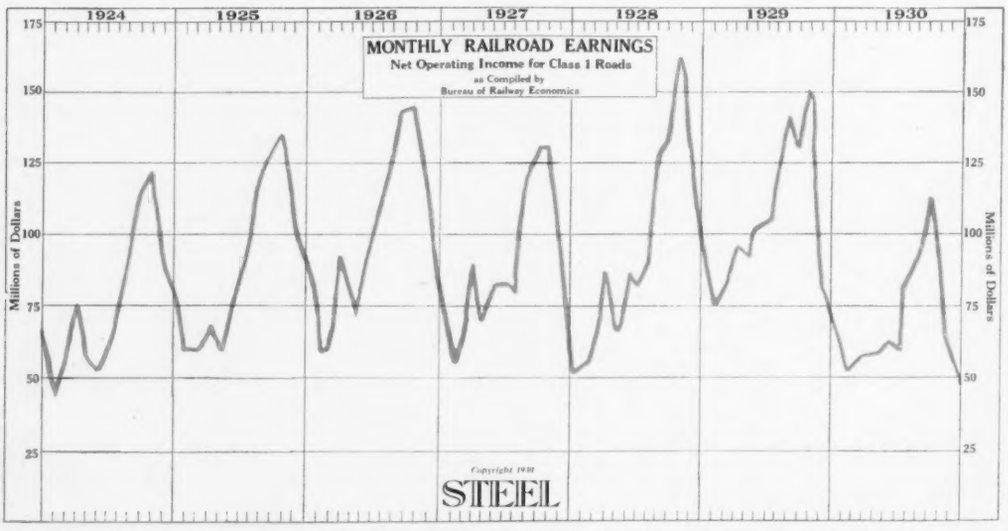
IMPORTS	
January, 1931	$183,000,000
December, 1930	209,000,000
January, 1930	310,987,000

Export and Import Values Fall as Foreign Trade Declines

Exports valued at $250,000,000 and imports valued at $183,000,000 made up America's January foreign trade. Shipments leaving the country dropped to about the same position which they held at low ebb in June of last year and imports went even lower. Compared with December, exports were down 8.4 per cent and imports declined 12.4 per cent, the trade balance being slightly improved. The value of exports in January was 39.2 per cent under the figure for January of last year, $411,314,000. Import values were down 41.2 per cent from $310,987,000, the total for a year ago. Last month's exports showed a heavy loss in cotton, and imports a heavy loss in various raw materials.

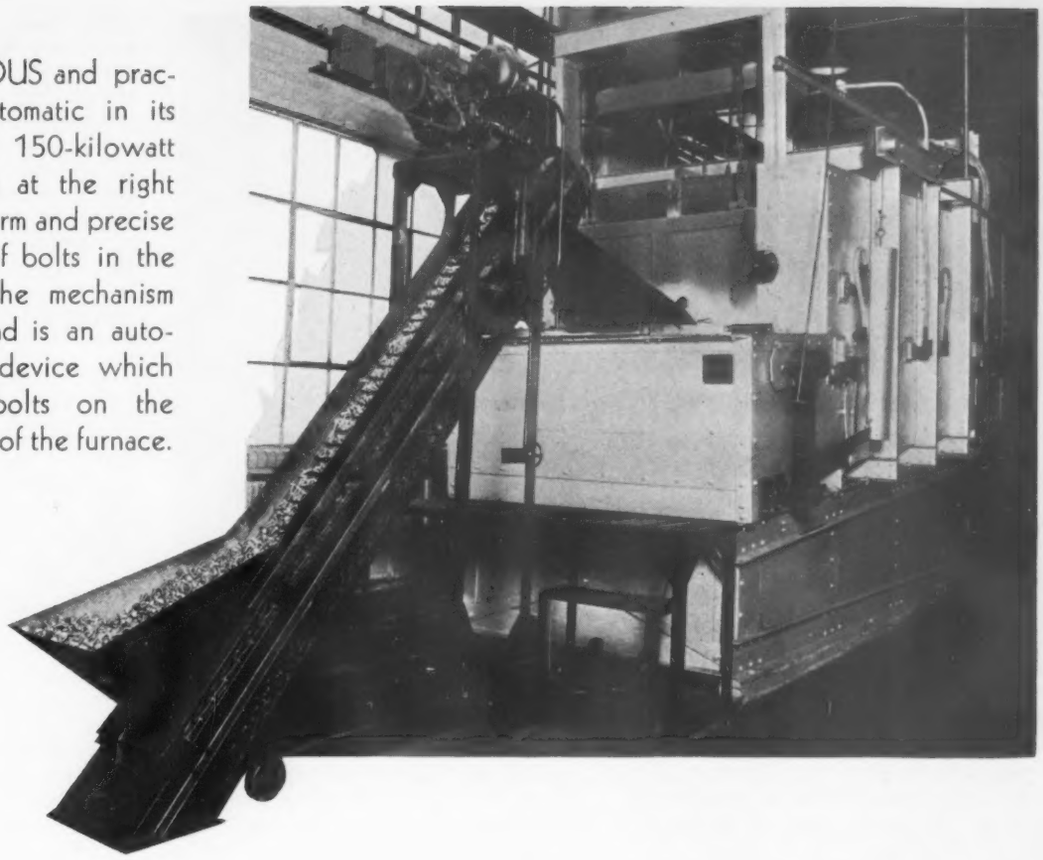
Railroads' Low December Income Is Similar to Trend for All of 1930

December earnings of 171 class I railroads dropped to $49,371,769, the poorest monthly record since February, 1923. Earnings during the entire year of 1930, at the lowest level in 18 years, amounted to $885,001,000, a decline of about 30.5 per cent compared with 1929. Although cost of maintenance and structures declined 17.5 per cent and taxes 12.2 per cent, the reduced activity in freight car loadings brought net earnings to the point where the return on the property investment was only 3.36 per cent, as compared with 4.95 per cent in 1929. Passenger traffic, although normally contributing a smaller portion of earnings, also helped lower the total, as it was the lightest since 1906.



Million Dollars	1930	1929
Dec.	49.4	72.2
Nov.	62.1	86.6
Oct.	112.3	152.9
Sept.	104.1	133.9
Aug.	95.6	141.7

CONTINUOUS and practically automatic in its operation, the 150-kilowatt electric furnace at the right provides a uniform and precise heat treatment of bolts in the larger sizes. The mechanism in the foreground is an automatic charging device which deposits the bolts on the traveling hearth of the furnace.



Improved Equipment Facilitates Heat Treatment of Bolts

BY A. H. ALLEN

Editorial Representative, STEEL

A DESIRE on the part of the Lamson & Sessions Co., Cleveland, to furnish customers with bolts of the highest quality has led to the installation of modern equipment for heat treatment of the product. Equipment and methods discussed in this article are those used in the West Eighty-fifth street division of the company.

In this plant are two separate and distinct heat-treating departments—the tool and the production. The tool hardening unit treats dies and tools used in the various manufacturing operations, while the production unit treats the bolts, nuts, etc., which are the product of these manufacturing operations. While the parts treated in the tool hardening department do not amount to any great tonnage, their value is high, due to the large amount of time and labor required for their manufacture. Therefore, it has been found economical to spend considerable time and money on the installation of furnaces, temperature recording and quenching equipment for properly treating these parts.

The tool hardening department is in the same building and adjacent to the die room where all production tools are made. It is well lighted and is provided with large sheet metal hoods above the furnaces for removing fumes and products of combustion. The six vertical electric and seven gas-fired oven furnaces comprising the hardening unit are grouped about a large rectangular quenching tank, so that tools may be transferred from the furnace to the quenching medium in a minimum length of time. The tempering unit, consisting of one vertical electric and two horizontal elec-

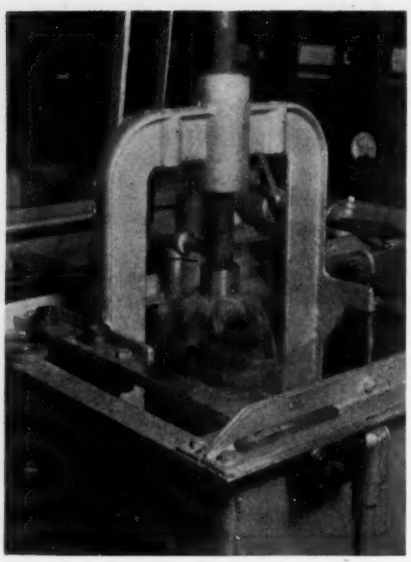
tric furnaces, a salt bath and a hot plate is located at the other end of the department.

Each of the electric hardening furnaces is equipped with a regulating rheostat, a wattmeter and a recording potentiometer, so that it is possible to control the heating cycle of the furnaces accurately, and to obtain a curve showing this cycle. This curve shows the heating rate, the critical point of the steel, the maximum temperature and the soaking time. The proper quenching temperature for the steel is determined, not by the indicated temperature, but by the distance above the critical point temperatures, as shown on the recorder chart.

Several Quenching Methods

After the proper temperature conditions have been attained, the dies are removed from the furnace and quenched by one of several methods—immersion in oil, water or brine, or by flushing over or through the die with water. The latter method of flushing through the hole, shown in an accompanying illustration, is used on all solid header dies. Dies quenched by this method show a marked increase in life over dies quenched by the ordinary immersion method. Water for this quenching process is furnished by a motor-driven centrifugal pump capable of operating at 150 pounds per square inch pressure. By means of an adjustable relief valve and pressure gage on the discharge line it is possible to vary this pressure as the operator desires.

The gas-fired hardening furnaces are equipped with manually operated



Closeup of quenching a solid header die by flushing through the hole. In practice the vertical pipe covers the top of the die and there is no spray of water

burners. Temperatures are determined by means of noble metal couples connected to a multi-point indicating pyrometer. These furnaces are used for hardening parts which cannot be handled conveniently in the vertical furnaces, for normalizing, for pack hardening and for hardening high-speed steel materials.

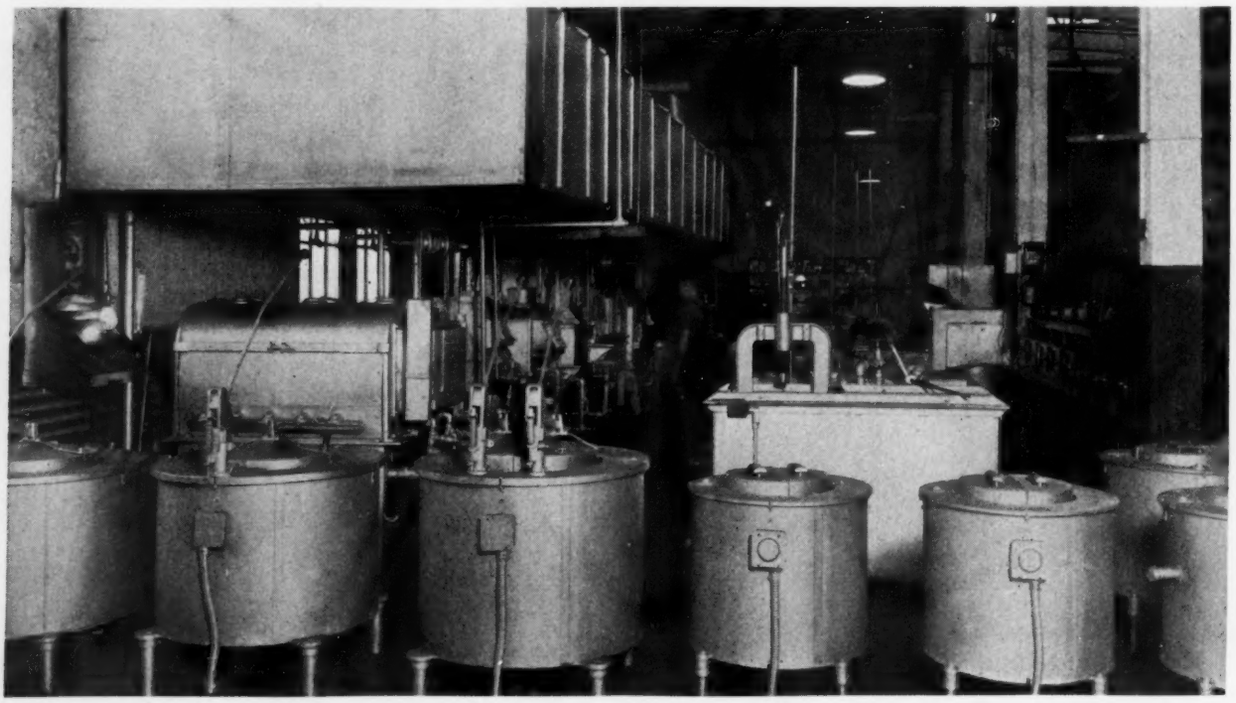
The production heat treating department is of the most modern type. Located on the top floor of a new, four-story building, the room is well lighted and ventilated. Glazed brick walls, gray enameled ceiling and hard maple floors give it the appearance of a public building rather than a commercial heat treating room.

On a mezzanine floor at one end of the department, a glass enclosed room houses the pyrometers, tensile machines, hardness testers and other necessary control and inspection equipment. From this room a foreman directs the various heat treating operations and inspects the finished product for physical properties.

Three Sequences Practiced

Three general classes of work are handled in this department—material which is carburized, quenched and drawn; material which is quenched and drawn; and material which is drawn. Carburizing is done in a gas-fired, rotary-retort furnace using city gas as the carburizing medium. This furnace is mounted above and behind two quenching machines of the inclined, rotating tube type. One of these machines is supplied with cold water from a large service line; the other is supplied with quenching oil from a storage tank on the floor below. A water-jacketed cooler is included in the quenching oil system, so that overheating of the coolant during the quenching operation is eliminated.

The operation of this furnace is as follows: The furnace is first heated to the proper temperature. The plate covering the front of the retort then is removed and the furnace tilted on its horizontal axis about 15 degrees, with the open end



Equipment for heat treating tools and dies, with electric furnaces in foreground, gas furnaces left center, quench tank right center, and automatic controls for electric furnaces at the extreme right

up. The material to be carburized is charged into the retort by means of a small conveyor, which raises the work from floor level to a point above the retort and there dumps it on a chute, discharging into the retort. The face plate is clamped on the retort, the furnace is lowered to a horizontal position, gas is admitted and the charge is brought up to the desired temperature and held at that temperature by a pyrometrically controlled fuel valve on the furnace.

When the proper heating cycle has been completed, the gas is shut off, the retort cover removed and the material slowly discharged into one of the quenching machines by tilting the furnace down. The hot material drops into the rotating tube of the quenching machine where it is rolled about in the coolant and at the same time gradually is moved up and out of the bath into containers.

New Electric Furnace Installed

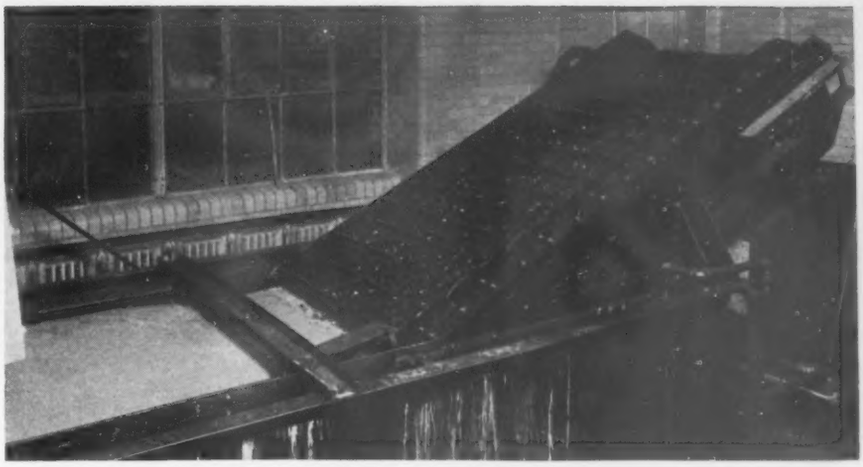
Material requiring a straight heat treatment is handled in a new 150-kilowatt electric furnace of the cast-link, traveling hearth type. This furnace is of rectangular section, 20 feet long, 7 feet wide and 6 feet high. In order to provide a gravity feed from the discharge end of the furnace to the quenching apparatus, the furnace is mounted on a structural steel base, 4 feet above the floor level, with the discharge end slightly higher than the charging end.

The traveling hearth is driven over two heat-resisting alloy drums located within and at opposite ends of the furnace. These drums are supported on external, air-cooled bearings. By means of a variable speed unit and chain drive to the drum at the discharge end of the furnace, a variety of hearth speeds may be attained.

A novel safety feature is incorporated in the hearth mechanism. If a bolt sticks to the conveyor and is carried past the discharge chute, it makes contact with a "wiper bar." This contact operates a relay which opens the motor circuit and stops the hearth, at the same time switching on a red signal light. A small door in the side of the furnace makes it possible to reach into the furnace and remove the bolt. When this is done, the relay may be reset and the hearth restarted.

The heating elements of the furnace are mounted on the walls of the heating chamber and are so connected that three distinct temperature zones may be maintained in the furnace, a preheating, a heating and a soaking zone. Each of these circuits is connected to a separate pyrometric control panel so that heating conditions may be varied.

The quenching apparatus consists of a rectangular steel tank, 15 feet long, 5 feet wide and 3½ feet deep, in which is placed an inclined metal conveyor belt. This belt is so mounted that about two thirds of its length is immersed in the quenching solution. The upper end of the belt is arranged to discharge its material into a hopper outside the quenching tank. By means of a variable speed unit, the speed of this belt, and hence the quenching time of the material can be changed to suit requirements.



Quenching tank at the discharge end of the electric furnace shown on Page 31. The inclined belt removes bolts from the solution to a hopper outside the tank

Coolant Is Circulated

Circulation of the quenching solution is provided by a submerged propeller and by baffle plates along the sides of the tank. Between these baffles and the tank walls are mounted cooling coils. The propeller forces the solution along the center of the tank and back over these cooling coils. By regulating the flow of cooling water in the coils, the temperature of the quenching solution can be controlled.

This furnace is practically automatic in its operation. The untreated material is dumped into the hopper of a small conveyor which raises it to a point above the furnace hearth and discharges it on a chute. This chute spreads the work over the traveling hearth as it moves into the heating chamber. After passing through the three temperature zones, the heated material drops through a closed discharge spout to the submerged conveyor belt. This conveyor belt slowly moves it up and out of the quenching bath, while the propeller circulates coolant about it.

The third type of heat treating done in this department is that known as the Lo-Anneal process, a method developed by the Lamson & Sessions Co. The lower carbon, cold-headed products are heated to temperatures which partially relieve the heading strains without destroying the high physicals developed in the

Four homo-type furnaces for use in the Lo-Anneal process. Bolts are charged in cans, one of which is shown at the left emerging from the automatic quenching unit

AUTOMATIC mechanism for dumping a can of bolts into shop boxes after the bolts have been heat treated

material by the wire drawing operation. This process and tempering of quenched material is carried out in eight vertical electric furnaces, each of 40-kilowatt capacity. These furnaces are of the positive, air-circulation type, a fan in the bottom of the furnace forcing air through the charge held in a large, sheet metal can with perforated bottom.

Gravity Conveyors Provided

The loaded containers are carried to the furnaces by a gravity conveyor. There they are picked up and put into the heating chamber by a ½-ton traveling crane. After the proper heating cycle the hot containers are lifted from the furnace and placed upon a second gravity conveyor which carries them to an automatic quenching machine. In this machine the loaded containers are slowly lowered automatically into a hot, soluble oil solution. This solution cools the material and gives it a brilliant black finish, strongly corrosion resistant.

When the material is quenched the containers are raised automatically from the quenching solution and moved by another conveyor to an apparatus which dumps the treated material into suitable shop containers. At this point samples are taken for physical tests. If these tests are satisfactory, the material is carried to the packing room two floors below on a special roller conveyor.

So effective is the use of the automatic features described above —pyrometric controls, automatic quenching machines, conveyors, cranes, etc.—that the personnel of this entire department is a foreman and two helpers. Not only do they handle all the production heat treating but also inspect all treated work for physical properties.

Some years ago the Lamson & Sessions Co. developed a rapid quench cycle for low-carbon bolts with the attainment of exceptionally high tensile strengths and fair ductility. This method was described in detail on Page 1025 of the October 25, 1927, issue of *Iron Trade Review*, predecessor to STEEL, and consisted in quenching the bolts from a gas-fired furnace in a stream of coolant under high pressure. Later, customers' demands changed, however, and although tensile strengths uniformly of the order of 125,000 pounds per square inch were possible, the trend turned to a higher-carbon material, bolts quenched under the old arrangement often proving too hard on installation tools. It is generally thought that the present heat treating arrangement combines the advantages of the rapid quench system with other desirable physical properties.

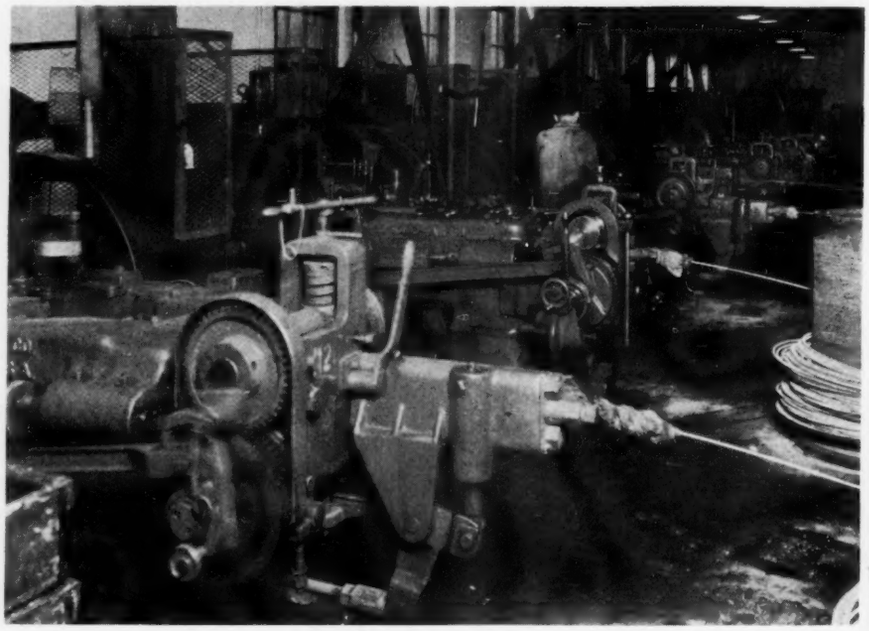
Apprentice Contest Rules Are Announced

Rules and regulations governing the 1931 American Foundrymen's association apprentice contest in patternmaking and molding have been prepared and now are available for distribution. Patterns and drawings to be used in those contests also are ready. The American Foundrymen's association committee on apprentice training, which conducts the competition will hold contests in patternmaking, gray iron and steel molding this year. Three prizes will be awarded in each group. First prize will be a $50 watch; second prize, $25; and third prize, $10.

Local contests first will be conducted by individual plants or by groups such as district foundry associations. Contests must be finished in sufficient time for the winning entries to be sent to Chicago to arrive not later than April 27 for display at the foundry convention at the Stevens hotel. Final winners will be picked by judges at that time.

Develops Metallized Wood

Wood impregnated with low-fusion point metals such as lead, tin or alloys and known as metalwood, is a late development in Germany, according to a foreign correspondent of the American Chemical society. The process, worked out at the Kaiser Wilhelm Institute for Iron Research, Dusseldorf, consists of immersing wood in the molten metal after it has been dried and subjecting it to a moderate pressure in a closed vessel. The metallized product is claimed to possess greater density and little tendency to burn.



Dies used in this battery of headers for large-size bolts are subject to high stresses which careful heat treatment of the dies must offset

Timken Roll Neck Bearings on a 16" and 48" x 84" four high "United" cold mill

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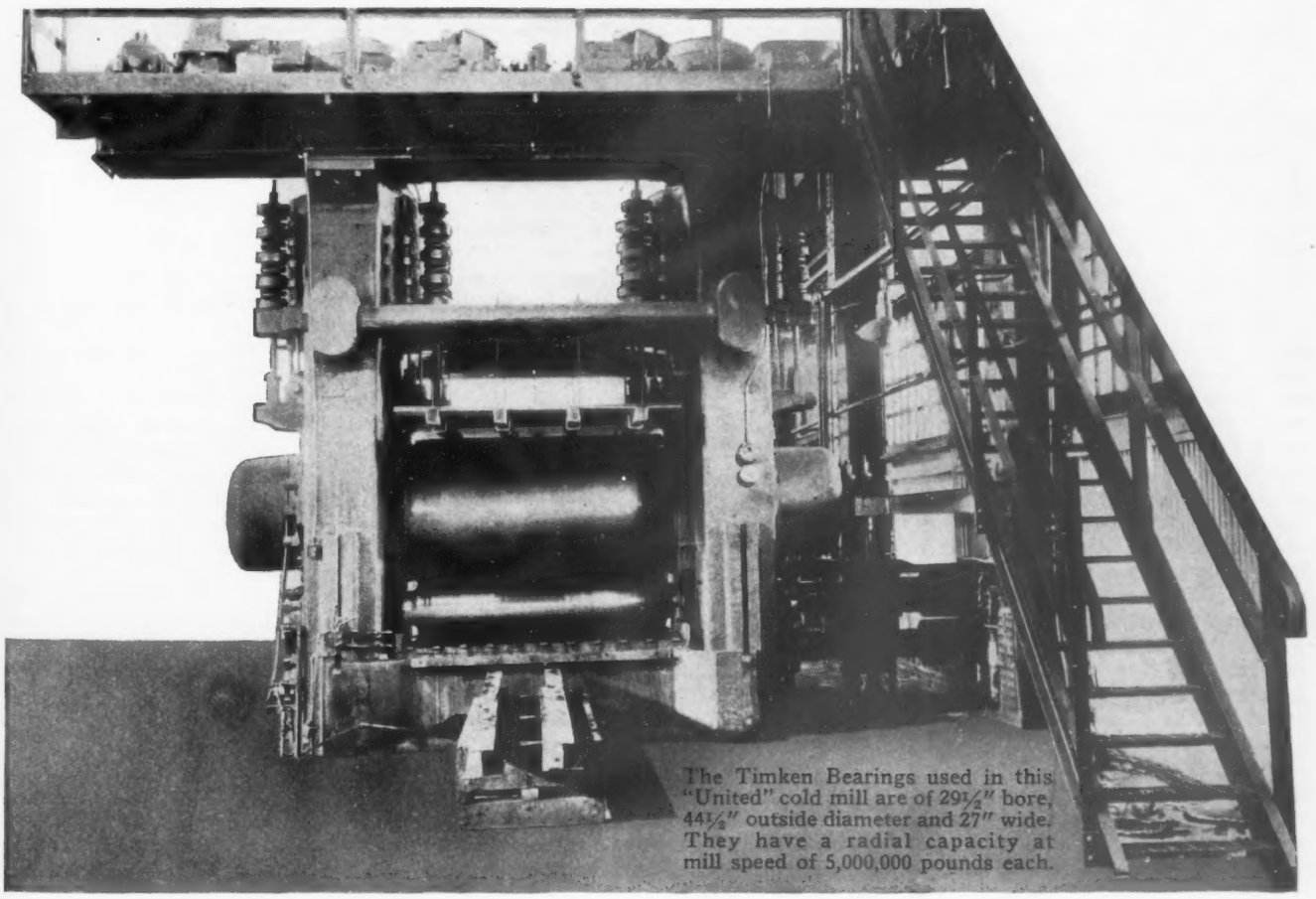
TIMKEN *Tapered Roller* **BEARINGS**



The Timken Bearings used in this "United" cold mill are of 29½" bore, 44½" outside diameter and 27" wide. They have a radial capacity at mill speed of 5,000,000 pounds each.

Steel Structures Clarified by High-Power Microscope

RAPID development in the construction and use of high magnification photomicrograph equipment is in progress, according to Dr. Francis F. Lucas, Bell Telephone Laboratories, New York, who delivered the annual Howe memorial lecture at the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 16-20.

Dr. Lucas told about the use of the present high-powered equipment and showed many interesting photomicrographs taken at 3500 diameters. He said that scarcely 10 years ago a magnification of 600 diameters was considered exceptionally high. Now he said new equipment developed jointly by the Bell Telephone Laboratories and lens manufacturers in Europe would shortly be set up in New York to give twice the resolution of present equipment. However, he cautioned that having good equipment was only half the problem. A novice with the best tools in the world cannot make a watch and the responsibility in the use and interpretation of high-power microscopic equipment increases with the increased ability to probe deeper and deeper into grain structure of metal.

Cracks Are Revealed

A startling discovery made in recent microscopic analysis is that heat treated steel is honeycombed with fine cracks. In spite of the small size of these cracks—only a few hundred thousandths of an inch across, it is believed that they may be the starting point of many of the so-called "fatigue failures" met with in practice. Lantern slides presented by Dr. Lucas showed steel surfaces magnified 3500 times, bringing these minute cracks into plain view. They are generally located along the borders of the martensite crystals which are formed in steel during the hardening and tempering process. It is believed that the cracks are formed by a slight shrinking of the steel as it passes from one crystal to another during tempering. Hardened steels of this nature are widely used in automobiles and similar places where they are subjected to heavy stresses and apparently the small cracks sometimes extend to cause rupture.

"Fatigue failures" of this nature are well known and are guarded against by using more steel than otherwise would be required. In fact, it is believed that investigations of this nature will show not why steel is as strong as it is, but why it is as weak as it is. If it is possible to develop a heat treatment which will harden steel as well as the methods now in use without forming these microscopic cracks, the strength of the steel will be greatly increased and it will therefore be possible to use smaller members for the same purpose. Because of the extensive and growing use of hardened steels this will have far-reaching results.

Dr. Arne Westgren, metallurgist, University of Stockholm, Sweden, delivered the annual Institute of Metals lecture, and discussed applications of X-ray analysis. The most important use of X-ray analysis as a means of identifying alloy phases comes when it is used for investigating residues obtained after a partial dissolution of alloys in acids, according to Dr. Westgren.

A news report of the convention, including a list of officers elected, will be found on Page 19 of this issue.

He presented a detailed description of work which has been progressing under his direction in Sweden and he also told of progress being made by other X-ray investigators. In conclusion he said, "The X-ray methods are at present only about 15 years old. Naturally, much remains to be done before they can be considered as experimentally accomplished. The development is rapidly proceeding on this scope.

"Already at its present stage, however, the X-ray analysis may provide an insight into the structure of alloys which was unattainable by earlier metallographic methods. By means of X-ray analysis the crystal structure of alloy phases may be determined. This new research method is therefore far superior to the older expedients of metallography as a means of establishing the real character of alloy phases, the chemical nature of which always has been difficult to define. X-ray analysis is, however, also valuable as a means of solving the primary task to which investigators on the scope of alloy research now more than ever before seem to have devoted themselves, that of establishing in detail the equilibrium conditions of alloy systems.

"So far, only a comparatively small part of the vast multitude of metallic systems has been subjected to X-ray investigation. The results are consequently too scarce to allow more than a glance below the veil hiding the secrets of the intermetallic reaction conditions. The part of chemistry which embraces the compound metallic substances, therefore, on the whole still retains its character of unbroken ground. Our knowledge is still incomplete regarding the laws which govern the combining of metal atoms into compound phases. Some of their features have, however, been brought to light by this new research method and the hope does not seem too bold that continued X-ray investigations of alloy systems will ultimately provide a much deepened knowledge regarding these problems."

Nondestructive Testing Symposium

A symposium on nondestructive testing of steel was planned at the meeting of the newly formed committee on this subject. The date of the symposium was not set definitely, but it was suggested that it be held within one or two months. At the committee meeting the various types of nondestructive tests were enumerated and the list included: X-ray diffraction tests, X-ray radiograph tests, magnetic tests for defects, magnetic tests for structure analysis, sonic tests and electric conductivity tests.

Under the last heading Mr. DeForest, consultant, American Chain Co., New York, described a so-called isothermal conductivity test which has been developed under his direction and which uses the principle of temperature difference in specimens being tested when subjected to eddy currents. He told of the familiar phenomenon of snow melting on a railroad track at points where the rail bond is poor, which illustrates the principle of his new method of testing. Practically, in testing pipe he applies to the outside of the pipe a coating of a substance with known melting temperature. This coating has an even thickness around the full pipe section. Eddy currents are then set up radially around the section being examined and afterward the surface contour of the coating material at this section is examined for variations from which the analysis of the material is made.

One member of the committee spoke of a new method of X-ray diffraction testing which has been developed in Germany within the last few months. He said he understood that the initial success of experiments indicated that this method would set up quantitative determina-

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tion of structure which might indicate strain. Others speaking on this same subject said that this was one of the most important phases of research work in nondestructive testing. It was suggested that some investigators in this country, notably engineers for the General Electric Co., were now at work on the interpretation of the diffraction spectra to determine strain.

Representatives of steel companies at the meeting said there was need for a clear statement of the practical requirements for nondestructive testing and the committee decided to add this feature to the symposium. One member said that nondestructive testing might be divided into two broad divisions, one covering tests for the purpose of detecting defects and the other covering tests made to determine the structure of the material.

The final aim of the committee is to have papers presented at the symposium covering the accomplishment to date and the future possibilities of all methods of nondestructive testing.

Studies Effect of Magnesia in Blast Furnace Slags

SEVERAL papers prepared by Richard S. McCaffery, professor of metallurgy, University of Wisconsin, Madison, Wis., Daniel E. Krause, fellow in metallurgy, University of Wisconsin, and others describing blast furnace slags and other features of blast furnace design and operation, were discussed at one session of the iron and steel division of the American Institute of Mining and Metallurgical Engineers. A particularly exhaustive paper on viscosity of slags covered detailed experimental work on the effect of magnesia in slags and pointed out among other things that "with a higher magnesia content there is less change in the viscosity when silica, alumina and lime vary among themselves than with a lower magnesia content. It would appear that this fact alone would have an important bearing on blast-furnace practice."

High-Manganese Slags

The production of high-manganese slag in the electric furnace was discussed in a paper prepared by T. L. Joseph, supervising engineer, C. D. Wood, assistant chemist and E. B. Barrett, metallurgist, all of bureau of mines, north central experimental station, Minneapolis. The utilization of the manganese in ore was advocated as a conservation measure. Recovery of manganese from the slag should prove profitable with ore containing from 8 to 10 per cent manganese. The method advised is to increase the manganese in the slag by additions and then convert the high-manganese slag into ferromanganese.

Discussion covering slag viscosity determination was extensive. Dr. Herty questioned Prof. McCaffery's use of square spindles. Mr. Goff said that it was difficult to interpret the highly theoretical calculations into actual blast furnace practice. He said he gathered that it might be possible eventually to determine what magnesia would be required to alter advantageously the viscosity of slags. He recommended condensing the data of the long report for reference. John Johnston, director of research, United States Steel Corp., research laboratory, Kearny, N. J., said that from the blast furnace point of view he thought the work of Prof. McCaffery was of great importance. He said it was relative values that were needed and that general trends had been set up.

Studies Furnace Reactions

The complex set of reactions which comprises the open-hearth steel process has been the subject of recent exhaustive study and calculation under the direction of Eric R. Jette, associate professor of metallurgy, Columbia university, New York, and some of the results of his work he presented in a paper before the iron and steel division. This paper while highly technical and involving much mathematical theory, brought out unusually active discussion.

R. S. Dean, metallurgist, bureau of mines, Washington, questioned the assumption which Mr. Jette made on the solubility of CO in Fe, claiming that there was little, if any, solubility. Dr. H. Styri, director of research, S. K. F. Industries Inc., Philadelphia, called attention to a possible error in the mathematics of Mr. Jette's elaborate analysis. Others to discuss this paper were Dr. C. H. Herty Jr., physical chemist, Pittsburgh experiment station, bureau of mines, Pittsburgh, and Yap, Chu-Phay, consulting physical metallurgist, New York.

The effect of inclusions on the strength of steel was discussed at considerable length in a paper prepared by A. B. Kinzel and Walter Crafts, research metallurgists, Union Carbide & Carbon Research Laboratories Inc., New York, and presented by Mr. Kinzel. One object of this work, according to the speaker, was the relative determination of cleanliness and for this there must be a yard stick. He suggested the total length of observed inclusions as counted and measured and added per square millimeter of the sample under investigation. I. N. Goff, research metallurgist, Inland Steel Co., Indiana Harbor, Ind., in discussing this paper pointed out that high-sulphur content usually accompanied low inclusions. He asked particularly about Mr. Kinzel's determination of sulphide inclusions and pointed out the difficulty of properly evaluating these in that they often do not show up in the photomicrographs. Mr. Kinzel in reply stated that special etching had been employed to bring out these particular sulphide inclusions and an attempt was made neither to emphasize nor to minimize their significance. Others who discussed the paper included: R. S. Dean, Dr. H. Styri, Alexander L. Feild, research engineer, Simonds Saw & Steel Co., Lockport, N. Y.

Other papers presented in this session included "A Thermodynamic Study of the Phasial Equilibria in the System Iron-Carbon," by Yap, Chu-Phay, and a paper on "The Carbon-Oxygen Equilibrium in Liquid Iron," by H. C. Vacher, assistant chemist, bureau of standards, and E. H. Hamilton, junior chemist, bureau of standards, both of Washington.

Discuss Lubricating Devices

Approximately 200 steel plant engineers attended the steel mill lubrication conference covering devices and appliances for steel mill roll-neck lubrication, held at Pittsburgh Feb. 18, under the auspices of the Association of Iron and Steel Electrical Engineers. Papers were presented by various makers of lubricating devices and appliances covering various phases of steel mill roll-neck lubrication. This meeting dealt with the subject of devices only. Roll neck lubricants will be discussed at the second of this series of meetings.

To Speak on Metallurgy

An address entitled "Nonferrous Metallurgy as Applied to Airplane Engine Parts" will be presented by R. R. Moore, metallurgist, Wright Aeronautical Corp., Paterson, N. J., at the March 5 meeting of the Philadelphia chapter of the American Society for Steel Treating, to be held at Engineer's club, 1317 Spruce street.

Improving Service of Steel Castings to Industry

SINCE the war the competition between various products of iron and steel has been greatly accentuated, not only because of numerous improvements in the quality of each product but also due to changes in conditions related to consumption. Rolled steel; forgings; stampings; and castings of gray iron, malleable iron and steel, all have participated in a constantly increasing scramble for the favor of consumers.

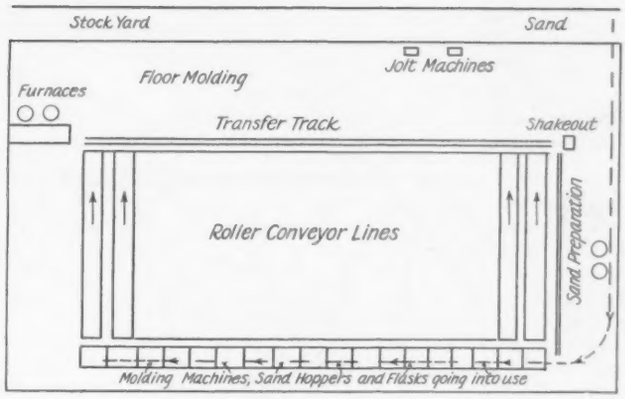

Fig. 1—Plan of new Lebanon Steel Foundry

While a metal product for a brief period may enjoy an undue share of a market due to extravagent exploitation, to the interest of buyers influenced by temporary fads, or to other factors, in the end each product survives according to its capacity for serving a definite need satisfactorily.

This article has to do with steel castings, which like many other products for engineering construction, have endured and survived their full allotment of strenuous competition from other materials. At times the markets for steel castings have been invaded by welded steel, pressed steel, forgings and other products. There has been considerable give and take in this competition, but steel castings have withstood the test with outstanding fortitude. By virtue of improved manufacturing methods, greater reliance on metallurgical control, closer study of markets, and better appreciation of what requirements are to be met in service, steel foundrymen now are in a stronger position competitively than at any time since the war.

This fact is apparent to anyone who visits the plants of the more progressive steel foundries of today. The contrast with typical establishments of the prewar period is most striking. The control of melting operations is vastly superior. All equipment is more effective. Supervision and inspection are more exacting. And the product itself conforms to much higher specifications.

An idea of the extent to which these changes have occurred in the better steel castings shops is afforded by the experience of the Lebanon Steel Foundry, Lebanon, Pa. This modern establishment is the outgrowth of a small crucible steel casting plant organized in 1911. From its inception it has specialized in small and medium weight castings of high quality. In 1915 a 1-ton electric furnace was installed, the company being one of the pioneers in electric melting in the steel foundry field. Shortly afterwards this unit was supplanted by a 2½-ton heroult furnace, and later a second furnace of this make and capacity was installed.

Recently the company erected a new foundry in which are incorporated numerous ideas from the accumulated experience of many years. The general plan was submitted to E. S. Carman Inc., Cleveland, who worked out the engineering and architectural details. The new foundry is thoroughly mechanized. The two heroult furnaces, transferred from the old foundry, are near one end of a high bay. Sand preparation equipment and shake-out apparatus occupy the entire opposite end of the building. Eighteen molding machines, served by individual sand hoppers extend along the south side of the building, as shown in Fig. 1. Finished molds are placed on roller conveyors which carry them north to the pouring stations, where they are poured in batches each time a furnace is tapped. After pouring, the molds are carried on an electrically operated transfer car built by the Link-Belt Co., Chicago, to the shakeout station, where the castings are removed from the flasks, loaded on steel skids, and transported by lift trucks to the old foundry building for cleaning and heat treating.

As a result of the improved layout and equipment of the new shop the normal production of 500 tons per month now is said to be achieved on a single shift molding schedule instead of the double shift formerly in vogue. Under the new set-up the output per man has been increased about 20 per cent.

In the old foundry the space once occupied by the heroult furnaces has been taken by two 1000-pound induction furnaces and one small experimental furnace of the same type, built by the Ajax Electrothermic Corp., Trenton, N. J. Electric equip-

Table I

Production of Steel Castings in United States

Net Tons

	Open-Hearth	Electric	Converter	Crucible	Miscellaneous	Total
1910	966,953	1,478	65,335	16,388	3,577	1,053,732
1911	639,734	2,103	63,953	15,714	2,718	724,222
1912	975,350	4,661	77,000	23,016	2,588	1,082,616
1913	1,019,442	10,312	90,167	19,680	3,633	1,143,233
1914	676,835	9,577	73,788	12,528	3,707	776,435
1915	823,572	25,832	103,573	16,527	1,340	970,843
1916	1,317,623	48,014	159,926	10,473	338	1,536,375
1917	1,358,735	72,700	178,385	4,294	262	1,614,376
1918	1,277,730	121,292	180,145	1,490	123	1,580,779
1919	854,022	124,891	110,671	1,130	2,888	1,093,609
1920	1,104,768	173,820	117,578	1,936	3,625	1,401,727
1921	486,578	95,306	43,466	824	703	626,879
1922	930,438	173,580	53,461	1,170	.....	1,158,649
1923	1,290,922	264,273	25,613	2,186	.....	1,632,995
1924	962,549	231,335	59,849	1,542	.....	1,255,276
1925	1,027,695	313,078	60,294	2,053	.....	1,403,120
1926	1,104,327	365,618	48,234	2,286	.....	1,520,465
1927	923,210	330,186	42,587	1,501	.....	1,297,484
1928	941,378	390,396	31,864	1,403	.....	1,365,041
1929	1,268,164	469,324	34,528	989	.....	1,773,005

Figures in Tables I and II are from *Research Group News* and are based on statistics compiled by American Iron and Steel institute.

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ROEBLING WELDING WIRE

ment was supplied by the General Electric Co. These furnaces are devoted exclusively to the production of special alloy steels for a wide variety of purposes.

The regular product is plain carbon steel castings of which the following analysis range is typical: Carbon, 0.25 to 0.35 per cent; manganese, 0.70 to 0.85 per cent; silicon, 0.35 to 0.50 per cent; phosphorus, under 0.05 per cent; sulphur, under 0.06 per cent.

Physical Properties

Representative physical properties of this steel when air quenched and drawn show: Tensile strength, 70,000 to 80,000 pounds per square inch; yield point, 40,000 to 50,000 pounds; elongation, 22 to 30 per cent; reduction of area, 30 to 50 per cent.

In this connection a word should be said of the inadequate manner in which the properties of modern steel castings are represented in many handbooks and by some standard specifications. An engineer contemplating the use of steel castings who relies upon what he finds in his reference book is likely to form a rather poor idea of the service which these castings can render.

The A. S. T. M. specifications A27-24 for steel castings for general service and for ships call for the following minimum properties, for the soft grade of carbon steel:

Tensile strength, pounds.....60,000
Yield point.....0.45 tensile strength
Elongation in 2 inches, per cent.....24
Reduction of area, per cent.....35

The commonest, soft grade of steel made in progressive foundries today has physical properties markedly superior to those quoted. Moreover, a large proportion of plain carbon steel castings made in modern shops have physical properties in excess of the medium grade called for in this specification. The minimum physical properties for the medium grade as called for in that specification are as follows:

Tensile strength, pounds.....70,000
Yield point.....0.45 tensile strength
Elongation in 2 inches, per cent.....20
Reduction of area, per cent.....30

The product made daily in the average, progressive steel foundry will pass A. S. T. M. specification A95-29 for carbon steel castings for valves, flanges and fittings for high temperatures service. The minimum physical properties called for in this specification are shown below:

Tensile strength, pounds.....70,000
Yield point, pounds.....36,000
Elongation in 2 inches, per cent.....22
Reduction of area, per cent.....30

For special purposes steel foundrymen produce alloy castings possessing much more impressive properties than those mentioned above. Normalized alloy castings with tensile strength of 95,000, yield point of 55,000, elongation of 20 per cent, and reduction of area of more than 35 per cent are not uncommon. Heat treated alloy castings run to tensile strengths exceeding 125,000, yield points of 95,000 pounds or more, elongation of 15 per cent, and reduction of area approaching 40 per cent.

From the foregoing it is apparent that the range of steel castings no longer is restricted to simple "as-cast" products as was generally the case years ago. Today many of the leading steel foundries maintain engineers trained to study the requirements of customers. With flexibility in production permitting the production of castings of numerous analyses and with various heat treatments, engineers are in a position to prescribe the type of casting which will best meet the exact needs of the customer.

This growing tendency toward the production of better castings is well illustrated by the experience of the Lebanon steel foundry. During the past two years every casting from the Lebanon foundry has received a double heat treatment of an air quench and draw, or temper. Such final treatment frees the castings from the strains incurred through uneven cooling in the mold, as well as strains caused by air quenching.

The Lebanon organization has gone to unusual lengths in perfecting its heat treating operations. Not satisfied with results obtained from former equipment and practice, it purchased a continuous twin oil burning furnace installation of the pusher type, built by Ryan, Scully & Co., Philadelphia. In the first section of the unit the castings are raised to the proper temperature, approximately 1650 degrees Fahr. (the exact temperature varying with the carbon content), then given an air quench in the open space between the two furnace units, and finally placed in the second furnace where they are tempered or drawn at a temperature of 1250 to 1275 degrees. Fahr. All stages of the process are under close pyrometric control.

Fig. 2—Molding bay in new foundry, reflecting trend toward mechanization in modern steel casting shops

Table II

Cast Alloy Steel Output in United States

Net Tons

	Alloy steel castings	Total steel castings	Per cent of alloy to total
1910	32,880	1,053,732	3.1
1911	63,044	724,222	8.7
1912	115,482	1,082,616	10.6
1913	99,598	1,143,233	8.7
1914	78,227	776,435	10.1
1915	109,644	970,843	11.3
1916	63,233	1,536,375	4.1
1917	75,632	1,614,376	4.6
1918	74,463	1,580,779	4.7
1919	50,817	1,093,609	4.9
1920	76,555	1,401,727	5.4
1921	45,086	626,879	7.2
1922	66,196	1,158,649	5.7
1923	103,286	1,632,995	6.3
1924	96,262	1,255,276	7.6
1925	126,093	1,403,120	8.9
1926	163,633	1,520,465	10.7
1927	163,345	1,297,484	12.6
1928	190,045	1,365,041	13.9
1929	216,071	1,773,005	12.2

Improved Methods Effective

That the improved methods of production and merchandising employed by the more enterprising units in the steel foundry industry are effective, is indicated by the statistics of orders and production. For instance, bookings for commercial steel castings compiled by the department of commerce averaged 78,865 tons in 1930 as against 81,373 tons per month in the previous 10-year period, 1920-1929. The 1930 monthly average was 96.9 per cent of the 10-year monthly aevrage—an especially good showing in view of the depressed conditions of the past year and an excellent record when compared with other commodities. For

(*Concluded on Page* 53)

Newly Devised Trimming Unit Speeds Shearing Operation

A COMBINATION side and end slitting machine with the side trimming shear placed at right angles to the end trimming unit is a recent development of the Yoder Co., Cleveland, for use in the sheet, tin and steel drum making industries. The accompanying illustration shows a 48 x 72-inch unit designed especially for drum makers. This machine weighs approximately 23,000 pounds, occupies a floor space of 12 x 20 feet and requires but one attendant for its operation.

Each shear is equipped with two threaded spindles housed in the same vertical plane and each spindle with two vertical cutting wheels which are paired one above the other at a predetermined distance apart to conform to the finished width or length to which the stock is to be trimmed. This arrangement of mounting the wheels provides micrometer adjustment for slitting any width of stock within the capacity of the machine.

Stock Is Aligned by Guides

The upper and lower cutting wheels revolve in opposite directions with their outer edges touching through the stock. Steel angle guides are provided on the feed table to facilitate the proper alignment of stock before it is served to the side trimming shear. The spindles, gear driven continuously by a 10-horsepower motor, are mounted in roller bearings and are adjusted vertically by setscrews provided in both the left and right housing of the trimmer.

As the side trimmed stock leaves the machine it passes between leveling rolls, which are an integral part of the trimmer, and is ejected onto a roller table. Once the sheet is free of the leveling rolls, its speed of progression is increaesd to 75 feet a minute by the table rollers to avoid congestion of oncoming work. As the sheet advances it strikes an electrical contact which brings it to rest near the end of the roller table and sets the cross-feed mechanism in motion. The cross-feed mechanism is actuated by a separate motor housed beneath the roller table and shown in the right foreground of the accompanying illustration.

Move Stock into End Trimmer

The vertical fingers of the cross feed, which are operated in a horizontal plane by rack and pinion, move the sheet at right angles to the roller table into a second trimming machine having its cutting wheels set at the desired distance apart horizontally to trim the required amount of stock from both ends.

If stock being handled is for light-gage drums, however, a set of flanging rolls are mounted at one end of the upper and lower spindles adjacent to the cutting wheels, and, as the sheet passes between, both ends are trimmed and flanged about ⅛-inch to provide additional metal for welding during drum fabrication. The complete trimming unit can be built for slitting any commercial width and length as well as for any thickness of plates, sheets or tin plate.

Proposes Changes in Reinforcing Bar Specifications

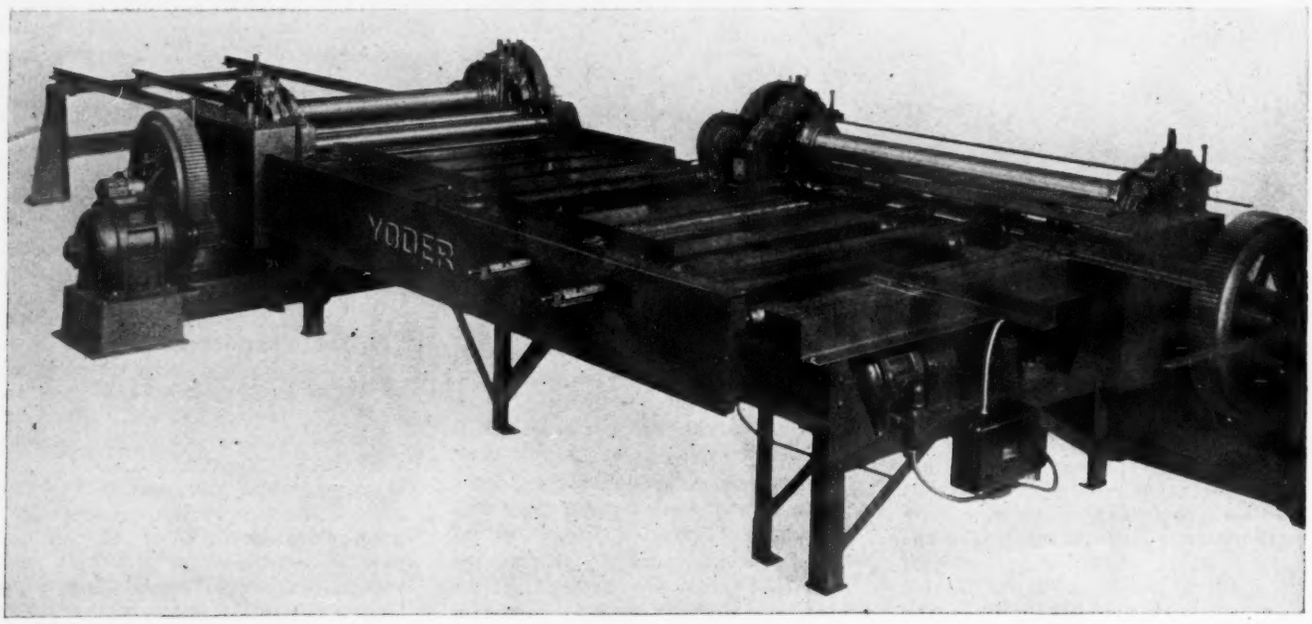
Two changes in the standard specifications for billet steel concrete reinforcement bars will be proposed by committee A-1 on steel of the American Society for Testing Materials at the next annual meeting of the society, with a recommendation that they be issued as tentative revisions. The proposed revisions make necessary certain changes in manufacturing and marking practices and involve changes in practice in handling new billet steel and in rolling.

The first change pertains to rolling and reads as follows: "The bars shall be rolled from new billets of properly identified heats of open hearth or lots of bessemer steel. No re-rolled material will be accepted."

The second proposed change contains the following recommendation: "The brand of the manufacturer shall be legibly rolled on all deformed bars, and when loaded for mill shipment all bars shall be separated properly and tagged with the manufacturer's test identification number."

Chemical Industries Exhibit

The thirteenth Exposition of Chemical Industries will be held at Grand Central Palace, New York, May 4-9, and will feature exhibits not only from all the 40-odd industries specified as chemical, but also from many others that produce material or equipment used in the chemical industries.



Combination trimming unit for slitting the sides and ends of light-gage sheet metal

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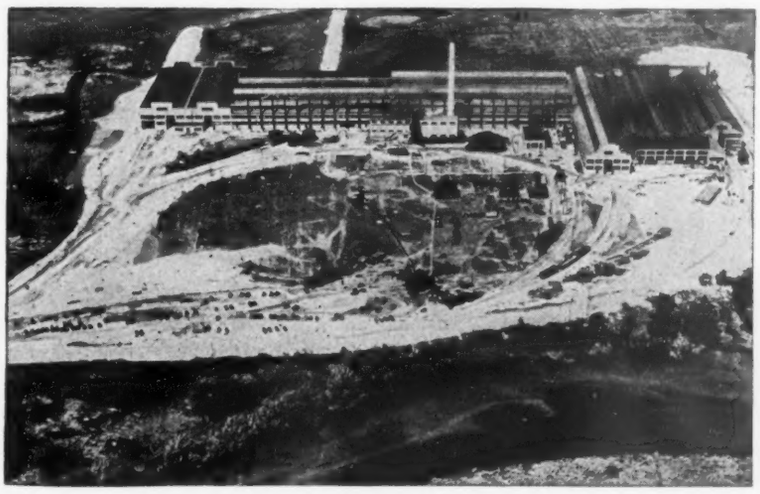

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In the preparation of building sites, the completion of difficult foundation work, and the solution of problems involving the handling, preparation and storage of raw materials we have been especially successful from both the technical and economic standpoints for many clients, at widely separated locations in this country and abroad.

The services of a highly skilled and broadly experienced organization are available for the correct solution and the economic working out of difficult problems throughout the range of the iron and steel industry, from the receipt of raw materials to the shipment of finished products, including Docks and Foundations, Coal and Ore Handling Equipment, Blast Furnaces, Sintering Plants, Gas Cleaning and Distribution Equipment, Boiler and Power Plants, Open Hearth Furnaces and Rolling Mills.

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Metal Exhibit Reflects Scale of West Coast Industries

BY E. F. ROSS
Associate Editor, STEEL

JUST within the portals of the Golden Gate, San Francisco last week supplied the setting for the second Western Metal and Machinery exposition and for five days eyes of the Pacific Coast's metal producing, fabricating and working industries were focused there. Two years ago, the first exposition of this kind to be held west of Chicago took place in Los Angeles, an event which met with such wide approval as to warrant similar shows at two-year intervals. Already plans are in the making for a third, again in Los Angeles, in 1933.

Similar to Eastern Shows

In many respects, the western expositions are similar to those which have been conducted annually in various steel centers in the East and Middle West by the American Society for Steel Treating, American Welding society, and other co-operating groups, except that somewhat less floor space is utilized. From the standpoint of scope, however, the western shows compare favorably.

Approximately 160 manufacturers and distributors of iron, steel and nonferrous metals and equipment for fabricating and processing maintained exhibits in San Francisco's large Civic auditorium, a structure well arranged to house operating displays effectively. Within the last 20 years, since the beginning of steelmaking on the Pacific Coast, industrial progress has been rapid and there now exists a thriving and self-sustaining industry almost wholly independent of eastern influence. It was not surprising, therefore, to find that a large number of the exhibitors were companies operating exclusively in the West. But at the same time, many eastern manufacturers of national reputation were represented with displays of materials and equipment, although in some cases they conducted exhibits in co-operation with West Coast distributors.

Steels constituted one of the principal products shown, ranging from heavy forgings and castings down to the smallest of twist drills. Among the steels were plain and alloy types for a variety of structural applications; tool steels; die steels; heat, acid and corrosion-resisting steels; nitriding steels; spring steels; and magnet steels. Included in semifinished products were ingots, blooms, billets, bars and rods; and in the finished and fabricated products were wire, sheets, strip, tinplate, seamless and electric welded pipe and tubing, tools and dies, cable, nails, gears, springs, magnets, structural sections, lithographed cans and containers, antifriction roller and ball bearings, ornamental specialties, valves, forgings, castings, oil field tools, heat treated parts; cooking utensils and innumerable other products.

Attracting wide attention were the recently developed heat, acid and corrosion-resisting chrome-nickel steels of the 18-8 and corresponding compositions. These materials were shown in sheet, strip, cast and rolled forms as well as in many finished products, such as valves and piping, pickling tank accessories, steam appliances, restaurant and cooking utensils and ornamental work, such as automobile and building trim.

Welding Displays Numerous

Serving to illustrate the prominence which welding has achieved in the fabrication of metal products, were numerous displays of welding equipment and accessories and many actual demonstrations of welding, both gas and electric. For gas welding and cutting, several manufacturers showed torches, both hand and automatic, pressure regulators, manifolds, acetylene gas generators and carbide. Makers of electrical welding equipment displayed arc welding generators, spot and resistance welders and electrode holders. Among general items were plain and coated wire and rods, goggles and gloves and many samples of welds, welded products and welded-on overlays or hard facings. One exhibitor had in his booth the completely welded framework for a small build-

PANORAMIC view of main exhibit hall in Civic auditorium, San Francisco, scene of the second Western Metal and Machinery exposition, held in conjunction with the National Western Metal congress, Feb. 16-20

ing, the members being standard light structural shapes.

A large portion of the floor space was given over to furnaces for the heat treating and processing of steel, these including gas, oil and electric units. Many were in operation to illustrate combustion and heat control. These furnaces ranged in size from toolroom units for high-speed steel to the larger ones for heating, normalizing, annealing, tempering and nitriding. Several salt bath furnaces were shown, as well as a high-frequency induction electric type for laboratory use. Several electrically-heated ovens suitable for enamel baking and core baking were displayed. Exhibitors of gas furnaces also operated many types of burners, premixers and similar accessories; likewise numerous units for oil burners were to be seen. One manufacturer showed two electrically-operated machines for heating by resistance, one for heating rivets and the other for heating rods for forging or upsetting.

Automatic Controls Shown

In connection with furnace displays were a number of exhibits of control apparatus for automatic regulation of temperatures and heating cycles. These devices included indicating and recording pyrometers, thermometers, thermocouples, motor-operated valves, automatic premixing valves, and indicating and recording pressure and volume gages.

Several makers of testing machines demonstrated units for hardness testing, and measurement of physical properties of metals and test specimens. Equipment for metallographic examination included microscopes, cameras and magnifiers, polishing machines and specimen clamps.

Machine tools in operation never fail to attract attention. Among machines for cutting metals were high-speed metal hacksaws, bandsaws, bench and floor-type drill presses, radial drills, bench and floor lathes, precision lathes, grinders, buffers, polishing machines, tapping machines, die cutters and saw filers. Also for reconditioning saws were retoothers and setters.

One of the smaller exhibit halls in Civic auditorium, where a number of the 160 exhibitors maintained booths

For use with machine tools was shown a wide variety of small tools, including carbon and high-speed twist drills, reamers, taps, plain and safety chucks, hacksaw and bandsaw blades and wrenches. Grinding wheels in many sizes, types and grains, from those used to snag castings to those employed in finishing operations, were to be seen. Several models of flexible shaft equipment were available for inspection as were a large line of portable electric drills, screw drivers, grinders and buffers.

The foundry industry was well represented in the San Francisco exposition, with several makers of castings exhibiting. Among the products were gray iron, malleable and steel castings in many analyses and a wide range of applications. Notable were displays of chrome-nickel heat, acid and corrosion-resisting alloys for special uses, principal products in this line being valves, piping and pumps. Manganese steel castings also were shown prominently.

Equipment for use in the foundry was shown and included cupola blowers, high-frequency coreless electric induction melting furnaces, molding machines, flasks, wheelbarrows, shovels and miscellaneous accessories.

Materials handling equipment was well in evidence in several booths. Machinery for this purpose consisted of electric storage battery and gasoline-operated platform and lift trucks, screw conveyors, and hand

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UNITED

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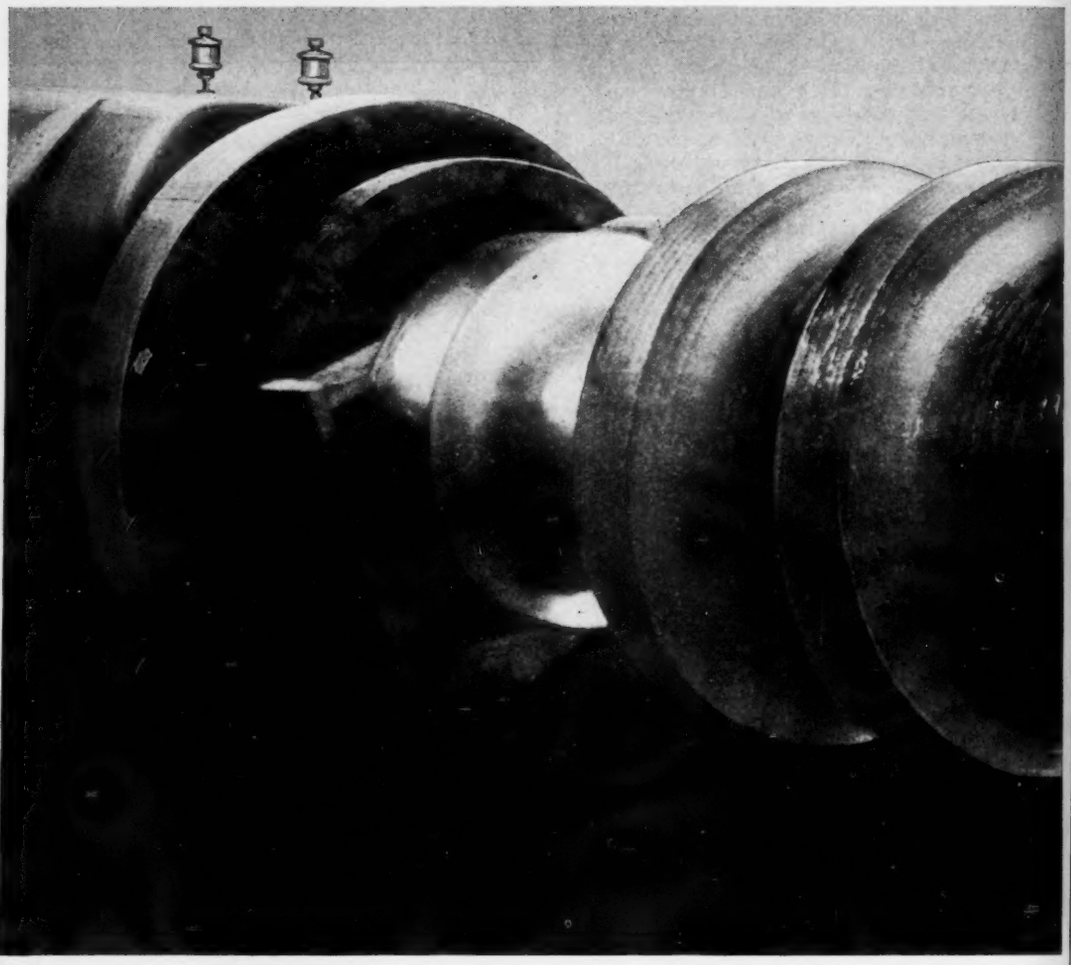

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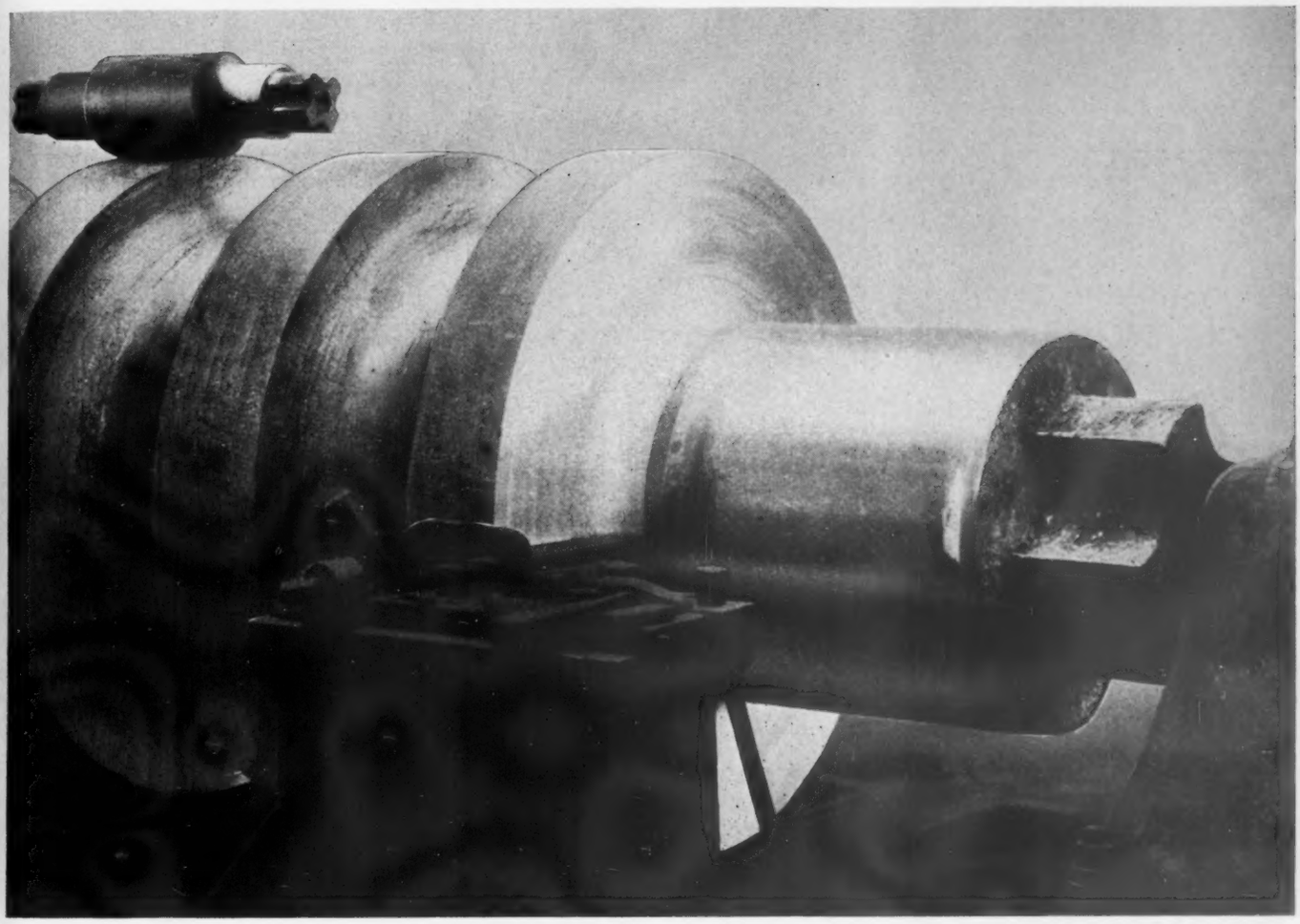

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ROLLS AND ROLLING MILL EQUIPMENT

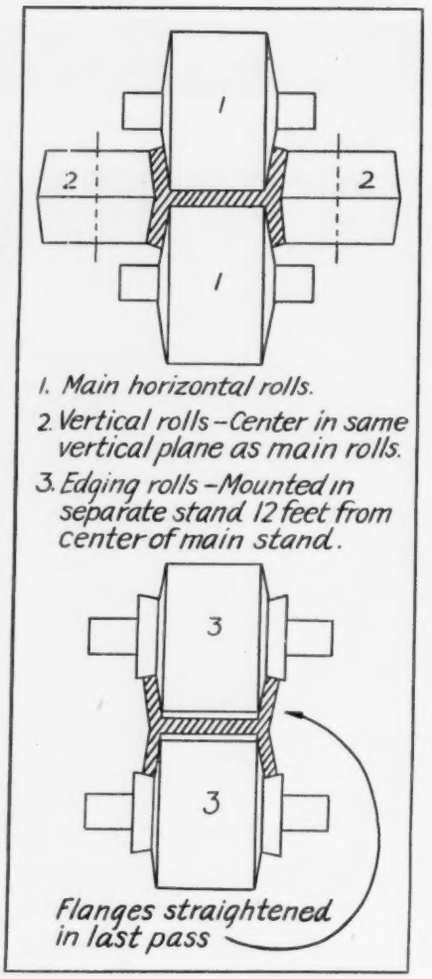
Rolls Are Set Automatically for Each Individual Pass

STEELMAKERS now are witnessing the first installation of a continuous plate mill. This fact was brought out by G. E. Stoltz, manager industrial engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in a paper entitled "Use of Electricity in the Steel Industry" which was presented before the Western Metal Congress, San Francisco, Feb. 16 to 20. The use of the specially-designed motor for flat-speed regulation, he pointed out, has gone from strip to sheet mills and now is invading the plate mill field. Sheared plate mills usually included 3-high roll stands where the metal is passed back and forth. A mill now is being installed to roll plate up to 90 inches wide. In general the old type of mill was able to produce 10,000 to 15,000 tons a month. This new mill will be capable of producing 50,000 to 75,000 tons a month. A few mills of this type would be able to roll the country's requirements.

Handles Large Tonnages

Electrification, while modifying processes of rolling, has at the same time been instrumental in placing the production in the hands of large units. The best economy in these large mills is obtained when rolling large orders. The larger steel corporations can do this as they can distribute their orders over a large number of mills. The smaller organization usually is required to roll a large number of small orders on the same mill. This in itself is uneconomical, more so now that these large tonnage mills are made possible.

For many years there has been an installation of steam engine driven wide-flange mills but the large majority of the structural material consisted of ordinary I-beams and channels shaped in grooved rolls. Recently new wide flange mills with motor drives have been installed. These mills had incorporated in them a number of new features but there were two important electrical problems to be solved if the maximum were to be obtained from these new installations. The accompanying illustration indicates the roll arrangement of a mill of this type which includes of a pair of horizontal main rolls directly driven from a 7000-horsepower motor. These horizontal rolls are used on the web and inside of the flange of the beam. In the housing with these same rolls are two vertical rolls that reduce the outside of the flanges to desired dimensions.


1
2
2
1
1. Main horizontal rolls.
2. Vertical rolls – Center in same vertical plane as main rolls.
3. Edging rolls – Mounted in separate stand 12 feet from center of main stand.
3
3
Flanges straightened in last pass

Arrangement of rolls in a 52-inch mill for producing structural material

Twelve feet from the center line of this housing is a set of auxiliary horizontal rolls that reduce the edges of the flanges. These rolls are driven by a 2000-horsepower motor. It is essential that these two motors carry their load and remain in synchronism at all times, whether the load on the 7000-horsepower motor is heavy, or that on the 2000-horsepower unit is light, or the reverse is true. With the metal coming through the mill in one particular direction it is necessary to change the speed relation between these two motors for every different draft that may be taken on the metal. In general the horizontal drafts vary from 3 to 30 per cent and are likely to be any value within this range. These drafts must be predetermined and the field of the 2000-horsepower motor adjusted in the short period between passes to accommodate the particular draft to be taken.

The other problem was the proper setting of the three pairs of rolls as the metal was being reduced from a beam blank to a finished beam. It could be imagined that if heavy drafts were taken in the vertical rolls during the early passes while most of the work to be done by the main horizontal rolls were delayed to the last few finishing passes, there would be considerable distortion and unnecessary strain set up in the metal. With three sets of rolls to be set after each pass it was inconceivable that two men would properly reproduce the drafts as each piece of metal came through the mill.

Screwdowns Are Automatic

This is not only important in order to uniformly elongate the metal throughout its entire section, but unless drafts could be predetermined it would be impossible to pre-set the speed of the 2000-horsepower motor. For this reason arrangements were made to automatically operate the screwdown on the three sets of rolls for each individual pass and at the same time the field of the 2000-horsepower motor is adjusted for its correct speed. This automatic setting of the rolls for each individual pass was the second distinct contribution electrification made to the success of this type of mill.

The success of the first mill installed with these features was phenomenal. The demand for these wide-flange beams is growing fast and even during periods of depression this mill usually is kept busy seven days a week. This, Mr. Stoltz concluded, probably will have the effect of changing the method of production of structural products and make many of the older mills obsolete.

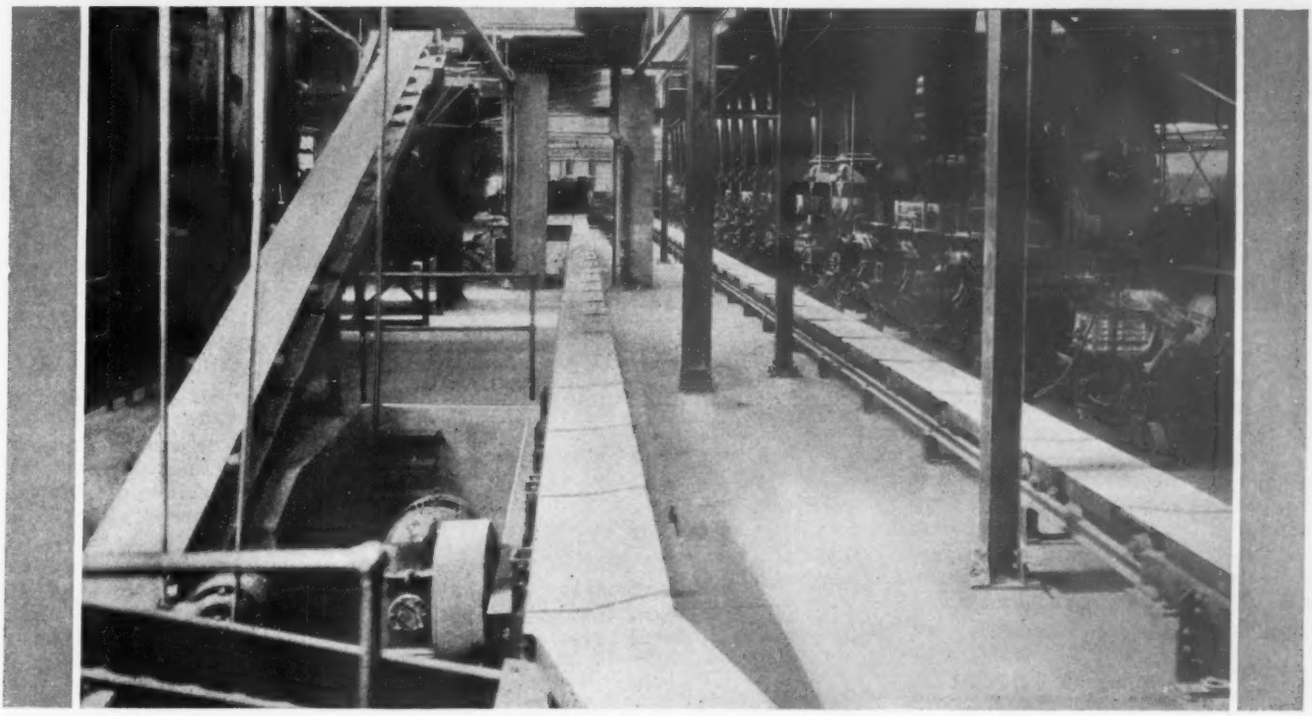
Appoints Committee on Museum Exhibit

Acting on the invitation of the New York Museum of Science and Industry, New York, the American Foundrymen's association has appointed a committee to co-operate with the museum staff in the preparation of an exhibit showing the development of the art of founding.

President N. K. B. Patch has appointed the following committee to co-operate with museum officials: G. H. Clamer, Ajax Metal Co., Philadelphia, chairman; E. H. Ballard, General Electric Co., West Lynn, Mass., vice chairman; Dan M. Avey, *The Foundry*, Cleveland; E. F. Cone, *Iron Age*, New York; A. E. Barlow, Sacks-Barlow Foundries Inc., Newark, N. J.; C. S. Neumann, Union Mfg. Co., New Britain, Conn.; L. C. Wilson, American Chain Co., York, Pa.; and P. M. Chamberlain, Newark, N. J.

FOUNDRY EQUIPMENT ENGINEERED

FOR EVERY PRODUCTION ADVANTAGE



Bartlett & Snow Sand Handling and Mold Conveying Equipment installed at the Wilmington Castings Co., Wilmington, Ohio

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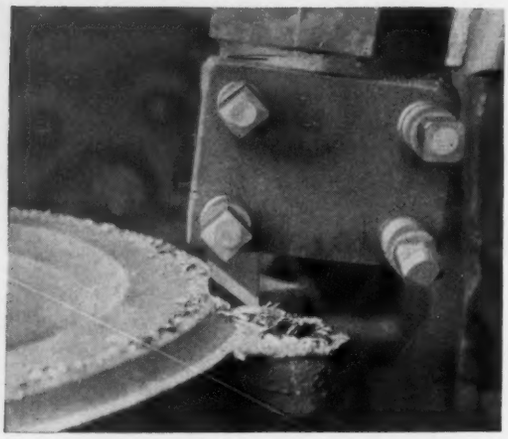
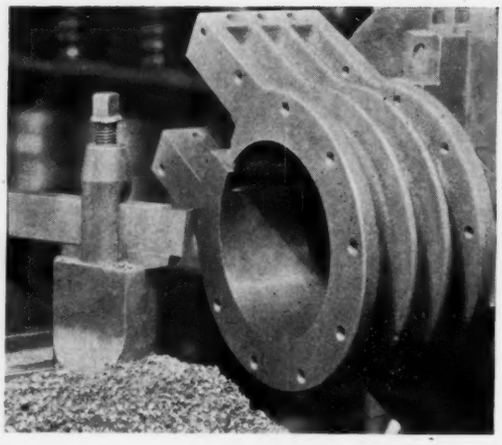


CAST car wheel chill (left), 33-inch diameter, faced and bored with tantalum carbide tool, removing 5/8-inch of scale and metal in one cut. At the right is a vacuum pump stage ring of semi-steel, finish faced and bored in one cut with Ramet-tipped tool



Tantalum Carbide Tools Show Unusual Cutting Capacity

PRODUCTION of a new hard cutting elementary metal for tool tips, distributed under flexible marketing conditions, has been started by Fansteel Products Co. Inc., North Chicago, Ill. This metal, known as Ramet, is a carbide of tantalum with metallic nickel as a binder, and recently has been subjected to numerous ordinary as well as unusual machining tests. A previous announcement of the development appeared on Page 50 of the Jan. 29 issue of STEEL.

Besides its low thermal conductivity, which precludes softening of the tip brazing on the tool shanks, advantages claimed for the new metal include its susceptibility to grinding by existing grinding equipment, its toughness, life between grinds, application to various types of machines, favorable comparative showing with such tool material as tungsten carbide, and availability through moderate price and freedom of distribution. Its practicability for small as well as large machine shop operations is assured.

Much Research Involved

In developing the tantalum carbide, the Fansteel company, and particularly its chief metalulrgist, Dr. C. W. Balke, who directed the research leading to the metal's production, had as the objective an alloy cutting metal for machine tools that would embody toughness and hardness, while remaining within standard grinding limits. It also was sought to produce a cutting tool that could be marketed with comparative freedom of distribution, at the same time avoiding infringement on patent and licensing rights.

Metallic carbides have been a subject of interest and research to Dr. Balke, director of research of the Fansteel plant, since 1915 when he produced successful carbide tools for machining synthetic plastics. Since late in 1929, he has given practically his entire time to the subject, during which time he has made and tested more than 300 lots of hard metals, consisting of carbides and borides of tungsten, tantalum, columbium and molybdenum.

Favorable Tests Reported

A number of extraordinary working tests, as well as standard machining operations, have been completed for Ramet. Commercial grades being produced range at 88.5 to 90.5 Rockwell hardness, using the diamond and 60-kilogram load, according to tests made by Dr. Balke. Test lots registering up to 92 have ben made, but this is regarded as too hard for practical purposes. The material is tipped to lathe tools, saws, miling cutters, drills and other tools by brazing. For experimental purposes tools actually have been brazed with zinc and have not failed. Tipped rock drills are expected to be available later.

The melting point of the metal is approximately 7952 degrees Fahr., the highest of all substances, except carbon. Tensile strength of 250,000 to 300,000 pounds per square inch is obtained.

A leading manufacturer of machine tools has completed a test in machining a bar of alloy automotive steel, S. A. E. 1050, 2 inches in diameter, using a tantalum carbide tool. The bar was turned from a 3-inch blank on a specially designed turret lathe in one cut, followed by a burnishing roller, to an accuracy of 0.0001-inch. A depth of cut of ½-inch was obtained at a feed of 0.020-inch, and speed of 170 feet per minute. After three days of test the tool is said to have shown virtually no wear. Demonstrations also have been made to show the metal's ability to cut 10 to 15 per cent manganese steel with a clean rib, as well as proper machining of other hard alloy metals, cast iron, carbon steel, bronze, aluminum, duralumin, bakelite and the synthetic plastics. It also cuts hardened high-speed steel when 15-degree negative rake is used.

It is stated by the producing company that tests have shown that the material can be used successfully at various operating speeds and feeds, suitable to the job in hand and the available equipment. Nevertheless, it is stated that the most satisfactory arrangement seems to be simply to maintain the feed already established and increase the speed of the operation. On some work it has been found possible to increase simultaneously both the speed and the feed. With a combination of high speed and light feed, the tool tips, it is claimed, will perform satisfactorily also, if the equipment is suited to this method of operation. It is emphasized that no special setup is required, so that advantageous use is obtained on small lots and short runs. The claim is made that a tantalum carbide tipped tool actually has machined tungsten metal.

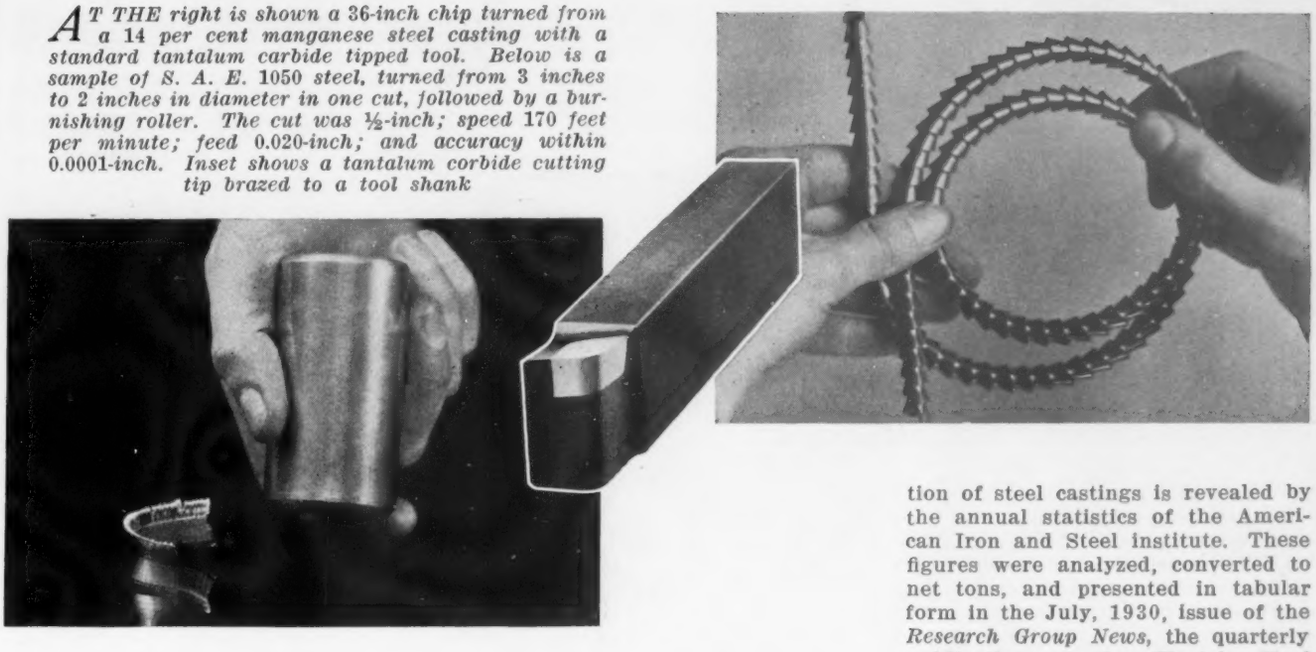
Powder Is Compressed

Tantalum ore, the base of the new material, is mined in Western Australia. The carbide is prepared in powdered form in ball grinding machines, during which metallic nickel is added to the abrasive carbide. The material then goes into molds almost identical with the form of the finished tool tip, and under hydraulic pressure of several hundred tons the blanks are formed ready for the first heat treatment.

A controlled grain structure is obtained in the grinding and heat treating processes. This is followed by nickel plating in preparation for the copper brazing to the tool shank to facilitate the brazing. The brazing is done in electric-hydrogen furnaces, the hydrogen atmosphere offering a protection from oxygen.

After brazing, the tool is ground to finished shape. Rigid testing at vari-

AT THE right is shown a 36-inch chip turned from a 14 per cent manganese steel casting with a standard tantalum carbide tipped tool. Below is a sample of S. A. E. 1050 steel, turned from 3 inches to 2 inches in diameter in one cut, followed by a burnishing roller. The cut was ½-inch; speed 170 feet per minute; feed 0.020-inch; and accuracy within 0.0001-inch. Inset shows a tantalum corbide cutting tip brazed to a tool shank



ous stages is made of each lot of tips. A finished tip from each lot is put to actual cutting tests. The various lots are tested for hardness and tensile strength, and, through the production process, every step is under observation from the laboratory. The tests actually begin with the ores and end with the cutting performance.

The Fansteel company is producing Ramet for distribution by a limited number of tool concerns, selected with their business reputation and experience in designing and servicing in view. These distributors are licensed. The metal now is used in about 75 plants.

Metal Exhibit Reflects Scale of West Coast Industries

(*Concluded from Page* 47)

and motor-operated hoists. Also shown were two magnetic separators, one of the pulley type and the other of spout type.

Composing a large classification in the nonferrous field were a number of supercutting materials of the tungsten carbide and corresponding compositions. These were displayed in the form of cutting tools of various sizes and shapes and as hard surfacing materials. Also shown were monel metal in various fabricated products, pure nickel, nickel alloys, molybdenum, calcium molybdate, tungsten alloys and tungsten concentrates. Copper and brass was to be seen in a wide range of tubing, valves and fittings.

Refractories for many types of metallurgical applications were displayed. These consisted of brick in standard and special shapes, high-temperature cements and plastic cements. Also shown with prominence was a comprehensive line of electrical refractories, these including supports for electrical heating elements, baffles and pyrometer tubes. One manufacturer exhibited nonmetallic heating elements capable of developing high heats.

Classified as hardening room supplies were hardening compounds, carbonaceous materials, salt bath salts, cyanides, antihardening cements, lead bath furnaces and many cast iron, steel and special alloy hardening pots and boxes.

Miscellaneous equipment shown consisted of lubricating and cutting oils, metallic diamond substitutes, artificial gas for heating, cutting and welding, leather and composition belting, cleaning tanks and compounds, and valve packing. With great quantities of natural gas available in California and adjacent territories, public utilities corporations were well represented with displays showing the applications of this fuel for commercial purposes. Many of the exhibits showing gas furnaces and gas burners were conducted with the co-operation of Pacific Coast gas companies.

Improving Service of Steel Castings to Industry

(*Concluded from Page* 43)

instance, the average for bookings for steel sheets in 1930 was 79.1 per cent of the past six years' average (10-year average not available). Daily average of pig iron output in 1930 was 92.4 per cent of the 10-year average. The daily average output of steel ingots for 1930 was 96.8 per cent of the 10-year average. These comparisons show that steel castings more than held their own in 1930.

The steady growth in the production of steel castings is revealed by the annual statistics of the American Iron and Steel institute. These figures were analyzed, converted to net tons, and presented in tabular form in the July, 1930, issue of the *Research Group News*, the quarterly publication of the Electric Steel Founders' Research Group, of which the Lebanon Steel Foundry is a member. The table is presented on Page 41. Table II, also taken from *Research Group News*, shows the rising trend in the annual output of alloy steel castings. Both tables are reprinted by permission.

The future of steel castings is inseparably associated with the development of industry. As business progresses toward another era of prosperity, consumers of cast steel will find broader opportunities for capitalizing on the progress which steel founders have been making during the past few years.

This progress has been stimulated in part by the activities of the Electric Steel Founders' Research Group, the work of which has been mentioned at frequent intervals in this publication, and, in a different and more widely effective way by the Steel Founders' Society of America. The activities of these and other organizations, supplementing the work done for the steel foundry industry by the American Foundrymen's association have helped materially to promote a better consciousness for steel castings throughout industry.

Issues Laboratory Directory

More than 1600 laboratories are listed in the fourth edition of "Industrial Research Laboratories of the United States," published by the National Research Council, Washington, as bulletin No. 81. The main list is arranged alphabetically by name of the company and is followed by an index of names, a geographical index and an index of subjects. The material, as presented in the bulletin, was furnished by the directors of the various laboratories.

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Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Hudson River Bridge

Details involved in building the world's largest suspension bridge, discussed by R. G. Skerrett, in Compressed Air Magazine, February 1931, *p* 3378, 7½ *pp.*, 23 *illusts.*

Each of the main cables is a fagoted arrangement of 26,474 parallel wires and in the finished state is 36 inches diameter. In the mass of concrete anchorage are 20 heavy steel girders. As a protection against corrosion, all steelwork in the anchorage was given three heavy coats of red lead before being enveloped by the concrete. More than 15,000 tons of steel was assembled in each tower. When completed the bridge floor will have an upper and lower level. The upper level will have two sidewalks and driveways for eight lines of vehicles, and the lower level will carry four lines of rapid transit cars.

—STEEL 2-26-31

FABRICATION:

Machining Properties

Results of a series of machining tests on a group of cold-drawn steels, by O. W. Boston; a paper presented at the annual meeting of the American Society of Mechanical Engineers in New York, Dec. 1-5, 1930, 11½ *pp.*, 23 *illusts.*, 5 *tables.*

The paper presents data obtained from a series of machining tests on thirteen cold-drawn screw-stock steels and two cold-drawn corrosion-resisting steels. Machinability values for standardized conditions are given for each steel as follows: The force required to remove a chip by a planer tool; the energy required to remove a chip by a single-tooth milling cutter; the torque and thrust developed by a ¾-inch diameter drill; the penetration of a ¼-inch diameter drill under a constant feeding load.

An attempt is made to correlate the results of these various machining tests with brinell, Rockwell and scleroscope hardness values, as well as the analysis and structure of each bar. Values representing the power required to cut 1 cubic inch of metal per minute under specific standardized conditions are given for planing, milling and drilling the various steels.

Data presented indicate that the machining properties of each steel depend upon its chemical composition, its heat treatment and method and degree of cold working, as shown finally by the resulting structure, and by its carbon content.

—STEEL 2-26-31

Welding Cast Iron

Advantage of using pure iron electrodes, coated with a suitable flux, discussed by H. D. Lloyd and J. S. G. Primrose, in the Iron & Steel Industry (England), February 1931, *p.* 175, 1¾ *pp.*, 1 *illust.*

Adhesion of the added metal to the cast iron is high because of the dilution of the carbon content at the junction of the work and the weld metal. By making short runs any slight chilling effect of the mass of the casting upon the first layer of the added metal is removed by annealing when the second and subsequent layers of weld metal are applied. The heating effect is so localized that no high contraction stresses are set up in the surrounding parts of the casting or the weld metal. When occasion demands that the added metal shall be for certain purposes of the same composition as the cast iron, it is preferable to start with a pure iron electrode, and by adjusting the flux coating, to deposit a synthetic cast iron in the weld which will be free from sulphur and phosphorus contaminations. Manganese dioxide is the most useful constituent of the flux coating.

—STEEL 2-26-31

PRODUCTION:

Teeming Speeds

Relation of casting speeds of ingots with varying types of nozzles, and the relation of these speeds to the ingots produced, discussed by A. Jackson, in the Iron and Steel Industry (England). February 1931, *p.* 167 3¾ *pp.*, 5 *illusts.*

Ingots poured through a magnesite ring nozzle are less liable to crack. Based on the pouring of about 1000 tons of steel, about half the ingots were teemed at 2 minutes and over per 6 tons, and of these 4.28 per cent showed cracking. The other half comprised ingots teemed below 2 minutes per 6 tons and of these 21.8 per cent showed cracking. Suitable teeming speed appears to be 120 seconds with an absolute minimum of 110 seconds. Five curves embodying results of teeming speed tests and illustrations of the design of nozzles are presented.

—STEEL 2-26-31

MISCELLANEOUS:

Die Casting Materials

Selection of the proper alloy for die castings discussed by J. J. Bauch, in Allied Die Caster, Vol. 1, *No.* 11, *p.* 5, 5 *pp*, 2 *tables*, 1 *illust.*

Harmful impurities in zinc die castings include lead, cadmium, iron and tin whose presence in high content causes and accelerates disintegration and distortion upon natural aging. After the selection of the proper alloy, exacting raw material specification is the best assurance a purchaser has of receiving a casting of permanancy and soundness. For usual requirements zinc alloys give the best satisfaction but when a question of weight arises and a light part of low specific gravity is needed, aluminum must be used. Tin is too expensive and has the lowest melting point of any alloy. Lead is used only where parts must resist corrosion and no great strength is required and for weighted parts where greater density is needed. In the choosing of an alloy of high strength and endurance resistance to impact and corrosion must not be overlooked. Polished aluminum alloys offer better resistance to corrosion for most uses. If a zinc alloy is essential it is possible to plate it with a resistant metal to eliminate or retard corrosion.

—STEEL 2-26-31

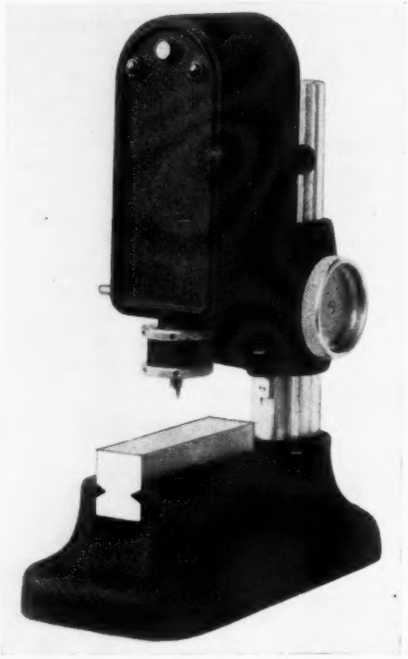
Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

Fast Precision Limit Gage Operates Electrically

Sheffield Machine & Tool Co., Dayton, O., has placed on the market an electric gage which in no way depends upon human judgment or sense of touch, and for which accuracy of 0.00001-inch is claimed. The accompanying illustration shows the gage ready for use, and gives an impression of its rugged construction and comparative simplicity.

Accuracy of work being gaged is indicated by a system of three flasher signals located in the upper rounded portion of the case. When no work is in place, a green light on the left side of the case burns steadily, and continues to burn if the work placed between the anvil and the movable contact is undersize. Should the work be within the limits of accuracy, this green light goes out and the center light of amber color flashes on. Should the work be oversize, the right-hand light, a red one, flashes on.

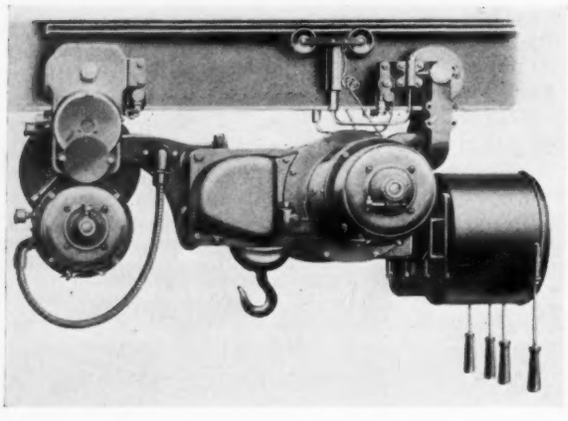


Precision limit gage shows work quality by three electric signal lights

Simplicity of Mechanism

The mechanism is simple. An indicating lever travels between two contact points, which are adjustable from 0.00002 to 0.002 inches by means of a "scissors" mechanism on the back of the case. Motion is conveyed to this indicating lever by parallel spring-steel reeds to which it is attached. These reeds in turn are attached to two blocks, the right-hand one being secured to the frame, while the left-hand one is tied to the rigid block by two other spring-steel reeds.

The movable block is held down against the plunger of the upper or movable anvil by a fine coil-spring, and when the work is placed between the anvils, this block is forced upward, thus distorting the reeds which support the indicating lever, thereby causing this lever to move from side to side. Normally, the coil-spring holds the movable block down and the indicating lever rests against the left-hand contact, causing the green, or undersize, light to burn, as previously mentioned. A small extension of the right-hand block over the lower part of the left-hand block acts as a safety stop and prevents damage to the gaging mechanism should the head accidentally be dropped. The gage operates on a current of 18 volts, which is obtained from an ordinary lighting circuit through a transformer similar to those used on electrical toys.



Sectionalized construction permits economical large scale production of hoists and trolleys, thereby reducing their cost to users even when special combinations are required

Hoist and Trolley Units Are Simple and Compact

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., has developed a line of compact hoists and trolley combinations which give maximum hoisting capacity and easy mobility with a minimum of mechanical parts. The accompanying illustration shows one of these electric hoists with motor-driven trolley mechanism, and indicates the method of control as well as the method of suspending and of feeding current to the unit.

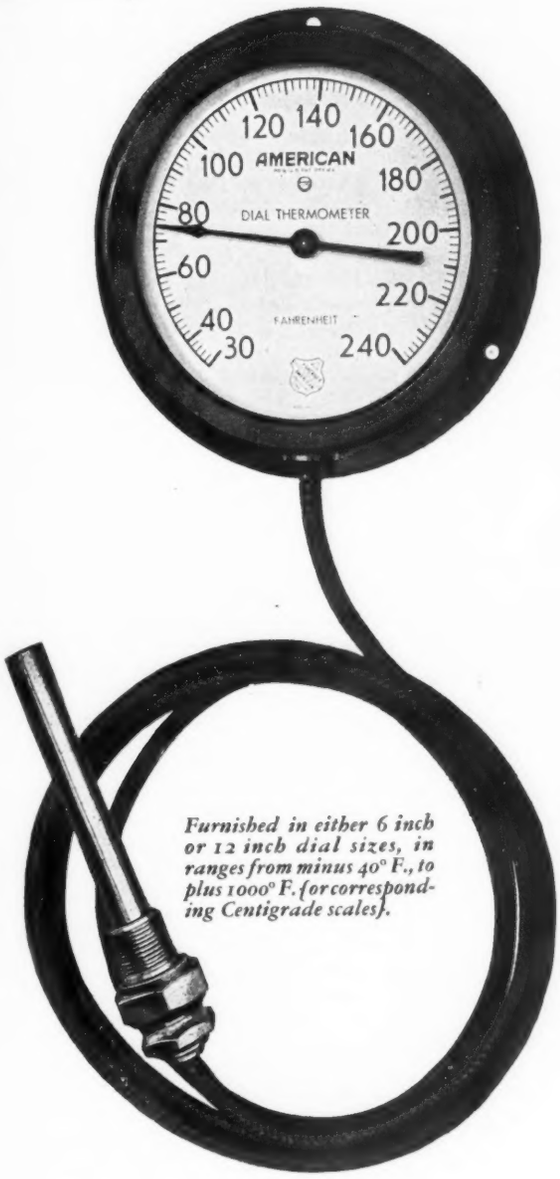
The builder points out that "sectionalized construction" permits economical large-scale production of these units by the interchangeable system. By the use of a standard body piece to which can be attached various motor and gear end sections, different requirements of speed and capacity can be met readily.

Motor Drive Features

The motors are designed for hoisting service, being made in 30-minute, 50-degree Cent. rating. Cooling fins are cast integral with the gear end section enclosure, and provide sufficient radiating area to insure cool operation of the load-brake under most adverse conditions. All moving parts in the gear end operate in an oil bath, providing positive automatic lubrication. The gears are of heat treated steel. With the exception of the close-clearance type of hoist, fully enclosed load-blocks are used.

The design incorporates an improved type of electric brake and limit switch, ball bearing trolley wheels for the push-type trolley, and balanced drive through the use of planetary gearing, which maintains positive alignment and reduces bearing pressure. The ease with which

Mercury



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Ashcroft American Gauges	A-70	American Tachometers	J-70	Hancock Forged Steel Valves	W-70
American Temperature Controllers	R 70	Ashcroft Power Control Valves	M-70		

combination of standard units can be made to meet unusual conditions eliminates the cost of special engineering.

◆

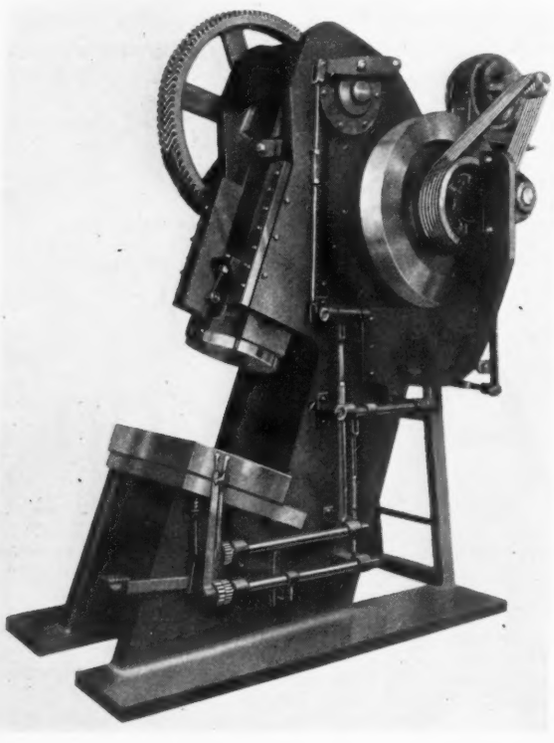
Presses Are Built up of Gas Cut, Arc Welded Plate

LaSalle Machine Works Inc., 3013-17 South LaSalle street, Chicago, has put on the market a new line of overhanging-type permanently inclined presses fabricated of heavy-rolled steel plate, cut to size and shape by acetylene torch and then arc welded into the respective units. Ribs and supports are so placed as to provide great rigidity. When tested with 50 per cent overload this type of frame showed no appreciable amount of deflection, and no "labor" was apparent in any of the working parts. The accompanying illustration shows one of these presses of 250-ton capacity, this machine having an 8½-inch crankshaft, 10-inch stroke and 14-inch depth of throat.

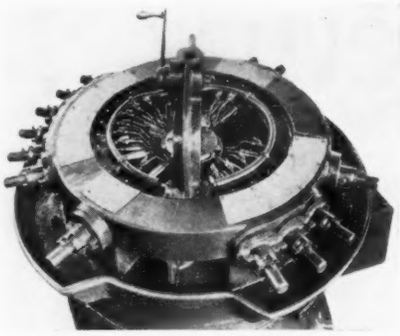
Frame, ram and gears all are of welded steel plate construction. Main bearings are bronze bushed and gibs are of bronze-lined steel. The backshaft runs on tapered roller bearings. The carefully balanced flywheel is provided with substantial outboard support. Annular ball bearings are incorporated in the pinions. A roller bearing mounted multiple-disk friction clutch is provided, this being equipped with an automatic safety stop designed to disengage at the top of the stroke. An auxiliary device operated by a hand lever is provided to disengage the clutch instantly at any point of the stroke. This feature is of great importance not only for safety but in connection with efficient die setting.

Minimum noise in operation is claimed for this press, the roller bearing mounted flywheel being the only moving part when the clutch is disengaged. The herringbone back gear and pinion also favor silent operation, in addition to providing smoother drive. Gibs and gibways are unusually long and as a result the top of the ram never is out of the ways, even at the limit of the 10-inch stroke and 4-inch adjustment.

Drive is by multiple V-belts direct from a motor mounted on a bracket at the rear top of the frame to a sheave on the flywheel. Lubrication of all working parts is effected through a one-shot, fluid grease system.



Heavy steel plate, cut to shape by means of gas torch and fabricated by arc welding, is employed throughout in constructing this 250-ton capacity permanently inclined press, which under 50 per cent overload shows no appreciable amount of deflection or binding of working parts



Multiple radial tapping is done by means of a special machine

◆

Multiple-Spindle Machine Drills, Reams and Taps

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, has designed a special machine for tapping several different depths and sizes of radial holes, all these operations being performed simultaneously. The accompanying illustration shows the machine set up to tap 13 holes in the periphery of a drop forging, seen in the center of the machine. This work is carried out at the approximate rate of 240 pieces per hour.

In designing this machine, a number of unusual problems had to be met, including uneven spacing of holes, variation in their size and depth, and unusually high production. Simplicity of design and rugged construction insure easy and uninterrupted operation. The drop forging is located in a fixture at a central point in the top of the machine and is locked in place by a clamp. The handle controlling this locking mechanism is located at the top of the fixture and when it is rotated through 180 degrees locking is accomplished. After the tapping operation is complete, this handle is moved back through the same arc, allowing the part to be lifted clear of the taps. Ease and speed in loading and unloading are insured.

Spindle Design

In the setup shown, each of the 13 taps, ranging in diameter from 3/16 to 9/16 inches, is fed by an individual ground lead screw which is an integral part of the spindle. The lead screw is driven by a spline from a master gear through a stationary bronze lead nut which is anchored in a bushing, nut and bushing being held in position by means of two spring hook clamps set 180 degrees apart. Each spindle is adjustable to tap to correct depth in each hole. By releasing the spring hook clamps and turning the lead nut, quick adjustment is effected.

The machine is driven by a 7½-horsepower motor controlled by an adjustable time-limit switch which determines the maximum travel of the taps. All bearings are insulated against dirt and chips by careful sealing. Coolant is circulated by an independently motor driven pumping unit, being fed to each tap by an individual pipe from a manifold. Heavy streams of coolant wash chips from the taps and

from locating points of the fixture, and carry them into a pan which extends entirely around the machine, from which the coolant returns to a sump through a screened drain.

◆

Hydraulic Honing Machine Gives Wide Working Range

Barnes Drill Co., 814-830 Chestnut street, Rockford, Ill., is marketing a new type of hydraulically reciprocated honing machine with self-oiling all-geared revolving mechanism. This machine is designed to hone cylindrical holes ranging in diameter from 1 inch to 4 inches. The stroke of the standard spindle can be varied from 1 to 12 inches. General design is indicated by the accompanying illustration.

The machine is of vertical type, with motor drive through silent chain. The standard 17 by 28-inch work table is of the stationary, screw adjusting type. The hones are reciprocated and rotated by a 6-splined spindle operating in the broached cast iron hub of a steel spindle-rotating gear, both hub and splines being equipped for self-oiling. Automatic reciprocation is given by a hydraulic cylinder mounted directly over the spindle, to which its piston is attached by means of a ball bearing coupling.

Features of Control

Operation is by an oilgear pump, a special valve controlling the automatic reciprocation. The cycle can be changed while the machine is running, by means of a volume regulator control, and the length of the stroke can be set by quick adjustable stops to give just the right amount of overrun at each end of the cylinder to avoid taper, bell mouth or barrel shaped results. By means of a stroke control rod, the operator can cause short strokes at any point in a cylinder to remove taper or to make any other necessary local corrections. In cases where the standard 12-inch vertical spindle travel is insufficient to lift the hones from the work, and air-operated table can be furnished which gives quick lowering of the table 6, 8 or 10 inches as required.

The standard machine has one speed specified by the buyer but two speeds are possible by an interchange of the two pick-off driving gears. The standard machine has overall height of 11 feet 1 inch, maximum distance from top of table to spindle nose is 41 inches, and distance from center of spindle to face of column is 10¼ inches. Reciprocating speed can be varied from 1 inch to 50 feet per minute and spindle rotating speed of

Hydraulic reciprocating mechanism gives close control of cylinder honing

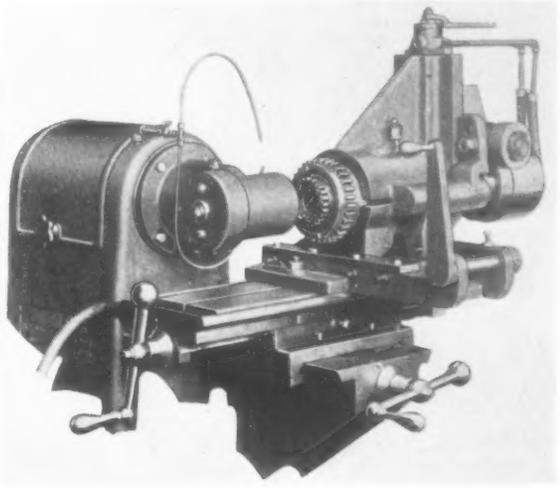
200 to 250 peripheral feet per minute is recommended. A 1200-revolutions per minute motor of 2-horsepower is recommended for work up to 2 inches in diameter, while for work between 2 and 4 inches in diameter a 3-horsepower motor is recommended. The standard machine occupies 45½ by 20 inches of floor space and its net weight with motor and starter is 1700 pounds.

◆

Automatic Machine Performs Special Work on Gears

City Machine & Tool Works, East Third at June street, Dayton, O., has developed a machine for chamfering and intermittently cutting or recessing gear teeth, these operations being required in connection with the manufacture of quiet second speed transmission, four-speed transmissions with quiet third and fourth gears, and "free wheeling" type of transmissions. This machine, shown in the accompanying illustration, is adapted particularly to finishing those parts sometimes called drive roller spiders, main shaft third-speed gears, main drive gears, and third and direct speed clutches. The machine will chamfer or intermittently cut and recess either internal or external gears.

The cam, located at the rear of the machine, furnishes the in-and-out motion which presents the gear to the cutter and withdraws it from the cutter in the desired manner. The machine can be set up to recess or skip practically any number of teeth in any desired ratio. In the setup which appears in the illustration, every other internal tooth is being recessed to a depth of 3/16 inch. It also would be possible to round all of these internal teeth after the recessing operation. Synchronization of the cutting cam with an indexing worm brings the proper gear tooth into position whenever the cam reaches the control point. The maker points out that this machine is giving high production speeds and low manufacturing costs in a number of plants manufacturing the new types of transmissions on a production basis.



Difficult operations on gear teeth, such as chamfering, rounding and intermittent recessing, are performed rapidly by this automatic indexing miller

BLISS

ROLLING MILL EQUIPMENT
FOR
HOT OR COLD ROLLING

MILLS

MILL REELS

COILERS

SLITTERS

WINDING REELS

LEVELING MACHINES

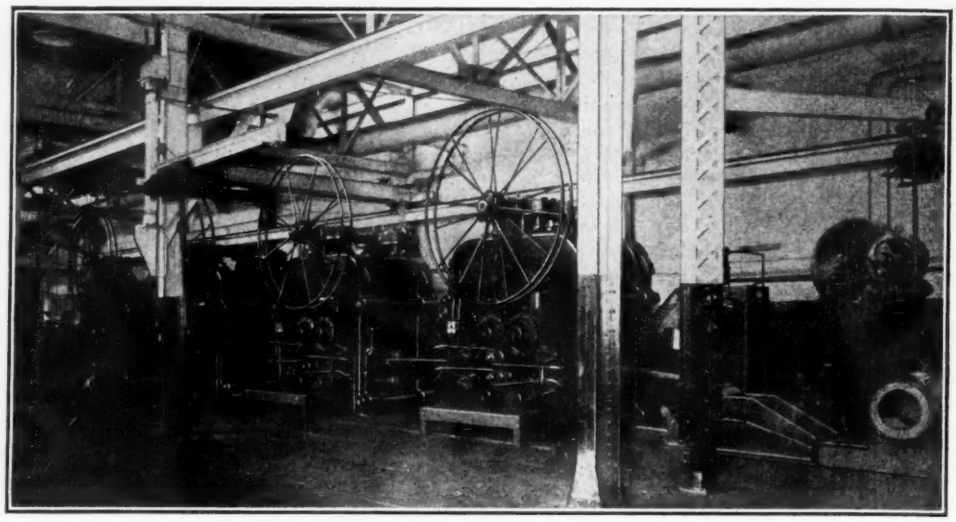
SHEARS

RECOILING MACHINES

SCRAP-BAILING MACHINES

ETC.

ETC.



BLISS CLUSTER MILLS
ROLLER-BEARING EQUIPPED

These mills are built in capacities ranging from 4″ to 72″ wide for hot or cold rolling.

Full details on request.

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BLISS

No. 576

Solid Adjustable Die Head Has Tangential Chasers

Landis Machine Co. Inc., Waynesboro, Pa., has placed on the market a new solid adjustable die head designed particularly for use on various types of special automatic machines with power feed and head reversing mechanism which now are used widely for threading pipe fittings and valves. This new die head is shown in the accompany illustration, the rigid mounting of the chasers being clearly apparent.

An outstanding characteristic of the new tool is its extreme simplicity, having as it does only four major parts, all of which are made of high carbon steel, heat treated and ground. Adjustment for size is effected by two screws which also lock the die head in such a manner as to give it rigidity equivalent to that of a solid die. The familiar type of tangential chasers form the cutting elements of this new die head. These chasers assure free cutting, accuracy, and long runs between grinds as well as unusually long useful life of the chaser. While the design of the new tool makes it unusually compact, each size covers a wide range. Three sizes are available, cutting maximum diameters respectively of ¾, 2 and 4 inches.

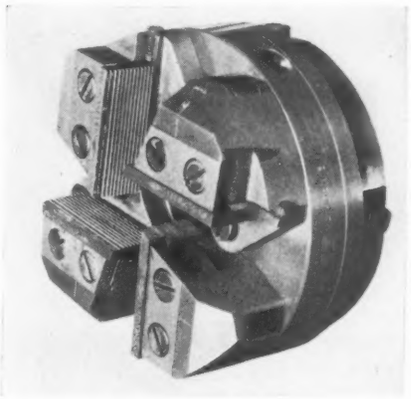
◆

Machine Operation Record Plotted by Instrument

Ohmer Fare Register Co., Dayton, O., announces the first of a new line of recording devices of particular interest to manufacturers and those engaged in the transportation industries. This first instrument is a seven day vibra-recorder designed to record the exact clock time during which any piece of machinery or any vehicle is in operation and during which it is idle.

The instrument resembles a small clock, which as a matter of fact it primarily is—being fitted with a high grade eight-day movement of the size jewel type which carries a dial easily read by the operator of the machine to which it is attached. In addition to moving the conventional clock hands, the mechanism rotates a drum which is enclosed within the body of the instrument and which carries a specially prepared paper disk chart.

This chart, which is about 5 inches in diameter, records seven days of time covering both day and night operations. On it are laid out spaces denoting minutes, hours and days.



Adjustable tangential chaser die head does effective pipe threading

While the machine to which the device is attached is in operation, the vibration, however slight it may be, causes a steel stylus or pen point to plot a wide line on the chart. While the machine is at rest there is no vibration, and the stylus then plots a fine line. Radial lines subdivide the chart into 24 segments denoting hours. The line drawn by the stylus is a spiral from outside toward the center, there being ample room on the chart for more than seven turns with generous spacing between. Each complete turn of the spiral represents 24 hours of the machine's record.

◆

Screw Press of New Design Has 100-Ton Capacity

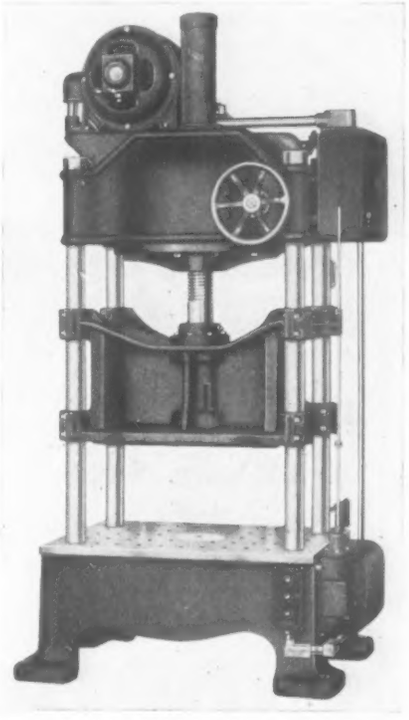
Jarecki Machine & Tool Co., Hall street and Steele avenue, Grand Rapids, Mich., has added to its line of screw presses a power-driven machine of 100-ton capacity. The accompanying illustration shows this new machine, which the maker points out embodies a number of important and novel features.

The press is designed for one-man operation, a diemaker being able to keep one hand and both eyes on the work and at the same time, through a conveniently located pushbutton control, to start, reverse, or stop the ram with precision. In addition to this electrical control, the ram can be moved a fractional part of an inch by means of a handwheel located on the head. The press is operated by a 10-horsepower high torque motor and is equipped with an automatic reversing switch which enables the operator to predetermine the depth to which the ram is to travel before the automatic reverse returns it to its normal position. In addition, two limit switches are provided to regulate the extreme travel of the ram in both directions, which is a safety feature as well as an operating convenience.

Ample clearance is provided between bed and ram, and the die can be blocked up on parallels to allow clearance for springs and cams, to allow inspection of a punch in its die, and to permit timing. This feature also allows a punch to be lined up with its die and to be raised high enough so that pressure pads, stripper plates and springs can be mounted conveniently without removing the punch from the press. The punch then can be brought down into the die to check the proper working of all parts. This ample space also is valuable when forming dies are being fitted up.

Parallelism Is Assured

Rigid four-column design insures parallel motion, enabling straight punches to be used, and eliminating any tendency to gouge or nick which will take place when alignment is not perfect. This feature of parallelism is particularly valuable when progressive dies are used. With hardened die fastened securely in position, a punch can be removed as often as desired and can be replaced easily exactly in its former position. Thus the diemaker can see exactly what he is doing and can observe the die and punch alignment from all sides as he carries out their final fitting and adjusting.



Power driven screw press features convenience of die adjustment

Pigs is Pigs?

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There are two kinds of pig iron—coke iron and Superior Charcoal Iron

AND straight pig iron behaves much better in your casting when it's mixed with 15% to 20% charcoal pig iron.

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Other qualities you get in your castings with a portion of charcoal pig iron are—reduction of shrinkage . . . greater toughness and density . . . less scrap loss (which saves you money in the end.)

All these extra qualities are yours when you add this simple sentence to your specifications—"All castings must contain not less than 15% to 20% Superior Charcoal Pig Iron." Superior Charcoal Iron Co., Grand Rapids, Michigan.

Superior Charcoal Pig Iron

Steel Activity Makes Further Gain

Diversified Demand Regarded as Good Market Foundation—Higher Prices Wanted, but Is Time Propitious?—Building Steel Awards Heaviest in Months

RAW steel production is holding steady, concluding February at about 53 per cent—a fractional increase over last week—compared with 48 per cent when the month opened. Finishing mill operations have registered slight gains, especially in bars, sheets and tin plate, foreshadowing further improvement in the ingot rate.

Releases for finished steel are moderately broader, orders being individually small but emanating from a wide variety of users. In fact, the most encouraging phase of the market situation is the fact that demand is well distributed and many consumers who have not been in the market for many weeks are again taking material.

Statistically, a greater tonnage of pig iron and steel ingots was produced and shipped in February than in January. Considering all products, the industry will enter March with more specifications for immediate rolling than a month ago. Sentimentally at least, the price structure is stronger than at the beginning of February.

Producers increasingly realize that current prices are not nutritious and each weekly gain in production speeds more remunerative levels, but there is a diversity of opinion whether the present is a propitious time for advancing prices. Regardless of the intrinsic merit of a rise, the determining factor likely will be its effect upon the recovery in demand which daily seems to be getting on more solid ground.

Within the next fortnight, when second quarter books are opened, the decision in regard to individual products will be made. As yet there is no serious inquiry for the next quarter. One maker of wire products favors a $2 per ton advance. In heavy finished steel and some grades of sheets a rise also is being discussed. Willingness of some pig iron producers to accept second quarter business at current levels indicates an unchanged situation there.

The award of 39,240 tons of structural material for the Cincinnati Union Terminal, of which 22,000 tons was booked by the R. C. Mahon Co., Detroit, and 17,240 tons by the McClintic-Marshall Corp., Bethlehem, Pa., made this week's structural lettings, at about 60,000 tons, the heaviest in 11 months.

Pending work is also large, the most active inquiries being for 45,000 to 50,000 tons for the Canadian National railroad terminal at Montreal and 15,000 tons for a parcel post building in New York. Concrete reinforcing bar work for industrial and construction uses lags, but one estimate places consumption for federal road work this year as high as 300,000 tons, or double 1930.

Railroad participation in the steel markets is practically limited to track fastenings, of which Chicago mills alone have booked 6000 tons. Prospective rail buyers are the St. Paul of 23,000 tons and Western Pacific of 10,350 tons.

A Pittsburgh independent mill has booked 7000 tons of steel pipe for the Magnolia Petroleum Co., Dallas, Tex. Distribution of 30,000 tons by the North Central Gas Co. is near. Cast iron pipe for spring work at New York and Chicago is more active.

Due largely to increased consumption by the automotive industry, pig iron shipments in the lake region are improving steadily, though featureless in most other districts. Coke continues inactive and unchanged. Scrap activity is only moderate, with price changes evenly divided between slight rises and recessions.

Preliminary statistics place January exports of iron and steel at 92,745 tons, a decline of 9443 tons from December, while imports rose 27 tons to 40,781 tons.

By districts, steel operating rates this week are: eastern Pennsylvania 52-53 per cent, Pittsburgh 47, Chicago 49, Youngstown 50, Cleveland 53, Buffalo 59 and Birmingham 65.

STEEL's market composite is unchanged this week at $31.61.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Feb. 25, 1931)	**$31.61**
Last week (Feb. 18, 1931)	**31.61**
One month ago (January, 1931)	**31.71**
Three months ago (November, 1930)	**31.92**
One year ago (February, 1930)	**35.34**
Ten years ago (February, 1921)	**48.81**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Feb. 25, 1931	Jan. 1931	Nov. 1930	Feb. 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.26	18.76	18.76	20.76
Basic, valley	16.50	17.00	17.00	18.50
Basic, eastern del. eastern Pa.	17.50	17.25	17.50	19.00
No. 2 foundry, del. Pittsburgh	17.76	18.26	18.26	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	20.00
*Southern No. 2, Birmingham	13.00	14.00	14.00	15.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	18.26	18.26	19.26	21.26
Malleable, valley	17.00	17.50	17.50	19.00
Malleable, Chicago	17.50	17.50	17.50	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.13	17.63	17.63	19.13
Ferromanganese, del. Pittsburgh	89.79	89.79	103.79	104.04

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.55	2.60
Connellsville foundry, ovens	3.25	3.30	3.50	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	30.00	30.00	31.00	33.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	31.00	33.00
Billets, open-hearth, Pittsburgh	30.00	30.00	31.00	33.00
Wire rods, Pittsburgh	35.00	35.00	36.00	40.00

	Feb. 25, 1931	Jan. 1931	Nov. 1930	Feb. 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.65	1.60	1.85
Steel bars, Chicago	1.70	1.70	1.70	1.95
Steel bars, Philadelphia	1.94	1.94	1.89	2.17
Iron bars, Chicago	1.75	1.70	1.70	1.95
Shapes, Pittsburgh	1.60	1.60	1.60	1.85
Shapes, Philadelphia	1.81	1.81	1.71	1.86
Shapes, Chicago	1.70	1.70	1.70	1.95
Tank plates, Pittsburgh	1.65	1.65	1.60	1.85
Tank plates, Philadelphia	1.80½	1.81½	1.81½	2.00
Tank plates, Chicago	1.70	1.70	1.70	1.95
Sheets, blue anl., No. 13, Pitts.	2.05	2.05	2.05	2.35
Sheets, black, No. 24, Pitts.	2.35	2.35	2.35	2.65
Sheets, gal., No. 24, Pittsburgh	2.90	2.90	2.95	3.30
Sheets, black, No. 24, Chicago	2.50	2.50	2.55	2.80
Sheets, blue anl., No. 13, Chicago	2.20	2.20	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.05	3.05	3.15	3.45
Plain wire, Pittsburgh	2.20	2.20	2.30	2.40
Wire nails, Pittsburgh	1.90	1.90	1.90	2.30
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	12.75	13.00	13.10	16.90
Heavy melting steel, eastern Pa.	10.50	10.50	11.50	14.50
Heavy melting steel, Chicago	9.75	10.00	10.20	13.25
No. 1 wrought, eastern Pa.	13.00	13.25	13.50	15.25
No. 1 wrought, Chicago	9.00	9.50	10.00	13.70
Rails for rolling, Chicago	12.00	13.00	13.10	14.80

Sheets

Sales Still Moderate, Though Gradual Improvement Is Noted —Prices of Most Grades Steady

SHEET PRICES, PAGE 65

Pittsburgh — Sheet business continues to improve gradually with a slight gain noted in recent operations. Requests for prompt delivery have increased schedules for some mills and output is up a few points at slightly above 40 per cent. Some consideration is being given to an advance in prices for second quarter although announcements so far are lacking. Occasional shading is noted of current quotations despite the fact most producers are adhering to levels that have prevailed since the first of the year. The market usually is 2.35c, Pittsburgh, for black sheets, 2.90c for galvanized, 2.05c for No. 13 blue annealed, 1.90c for Nos. 9 and 10 blue annealed, and 3.30c for autobody. Automotive orders show increases in some directions, though confined to small lots.

New York—Galvanized sheets continue 2.90c, base, Pittsburgh, and a slight improvement is noted.

The American Sheet & Tin Plate Co. has put in effect a new list of width and length extras, as reported briefly in the Feb. 19 issue of STEEL. Examination of the new list discloses a general reduction of the extras on all widths up to 42 inches and up to No. 21 gage. Extras on all widths of sheets No. 21 gage and over are increased. Thirty items are unchanged, 13 have been lowered 5 cents; six have been reduced 10 cents and one 15 cents. Four items on the list have been raised 5 cents; two 10 cents and four 15 cents.

It is believed similar revisions will be announced by other producers.

Buffalo—Demand for sheets continues spotty, with flurries of activity followed by depression, so that mills have been unable to hold production above 50 per cent.

Cleveland—Sales have been retarded slightly by recent holiday influences. All consuming groups continue to be heard from, but commitments continue below normal. Shipments this month probably will exceed January's, due to better releases from automotive interests. Books have not been opened for second quarter. Weakness below 2.90c, Pittsburgh, in galvanized persists, though a leading seller of that grade here claims 2.90c is holding with some chance of a price rise for second quarter. Autobody releases have been gaining.

Youngstown, O.—Conservative improved buying is noted in the sheet market. Newton Steel Co. has decided to start up a part of its Monroe, Mich., works by the first week in March. Common sheets show little gain in orders. Special grades appear more in demand. Quick deliveries are demanded, in some instances within one week of the mailing of specifications. Quotations hold at 2.35c, Pittsburgh, for common black; 1.90c to 2.05c for blue annealed; 2.90c to 3.00c for galvanized; 3.30c for autobody, and 3.60c for furniture grades.

Philadelphia—Sheet prices are steady and some producers are expected to name second quarter quotations soon. The market is featureless.

Chicago—Sheet mill operations, at 55 to 60 per cent, are the highest this year. Indiana Harbor mills expect to maintain a full 17-turn week, and probabilities are that the ten hot mills at Milwaukee which have been down since the beginning of the year may resume shortly. Blue annealed demand is outstanding. Low prices are named in the Southwest for galvanized roofing products, shading of $1 to $2 a ton being noted.

St. Louis—Producers and distributors of sheets report gradual improvement in new business. Specifications are expanding.

Cincinnati — Sheet mills in this district are maintaining production schedules at a rate slightly higher than in January. Prices are unchanged.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.35c
Philadelphia, delivered	2.64c
Gary, Indiana Harbor	2.45c
Chicago, delivered	2.50c
Birmingham, base	2.50c
St. Louis, del.	2.70½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.55c to 2.65c
Gary, base	2.65c to 2.75c

GALVANIZED NO. 24

Pittsburgh, base	2.90c
Philadelphia, delivered	3.19c
Chicago, delivered	3.05c
Gary, Indiana Harbor	3.00c
Birmingham, base	3.05c
St. Louis, del.	3.25½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.05c
Chicago, district mills	2.15c
Chicago, delivered	2.20c
St. Louis, delivered	2.40½c
Philadelphia, delivered	2.34c
Birmingham	2.20c

BLUE ANNEALED SHEETS NO. 9-10

Pittsburgh, base	1.90c
Chicago, district mills	2.00c
Chicago, delivered	2.05c
Philadelphia, delivered	2.19c
St. Louis, delivered	2.25½c
Birmingham	2.05c to 2.10c

AUTOMOBILE NO. 20

Pittsburgh, base	3.30c

FURNITURE NO. 24

Pittsburgh, patent leveled	3.60c

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$5.00

Gary, Ind., base 10 cents higher.

(Per pound)

Long ternes, 24, assorted	3.35c to 3.45c
Long ternes, 24, unassorted	3.25c to 3.35c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c to 2.30c
Spring wire	3.20c
Wire, delivered Detroit	2.50c
Nails, delivered Detroit	$2.35

Joliet, DeKalb, Waueagan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.80½c to 1.85½c
New York, delivered	1.88c to 1.93c
Boston, delivered	2.00c to 2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.05c to 2.15c
St. Louis, del.	1.95½c

Structural Shapes

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.81c
New York, del.	1.905c
Boston, del.	1.985c to 2.035c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham, base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.15c to 2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coasts, c.i.f.	2.25c
Cleveland, base	1.65c to 1.70c
Philadelphia, del.	1.94c
New York, del.	1.98c
Boston, del.	2.05c
Pittsburgh, cold finish	1.75c to 1.80c
Pittsburgh, forg. qual.	1.85c to 1.90c

RAIL STEEL

Chicago Heights	1.60c to 1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c
New York, delivered	1.93c to 2.03c
Philadelphia, delivered	1.89c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet	2.00c
Chi., rail steel	1.60c to 1.70c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold-Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10	
2300	1.50	Cr.	0.45
2500	2.25	51.00 Cr.	
3100	0.55	spring	0.20
3200	1.35	6100 bars	1.20
3300	3.80	6100 Spring	0.95
3400	3.20	Cr., Ni., Van.	1.50
4100 .15 to .25 Mo.	0.50	Carbon Van.	0.95
4600 .20 to .30 Mo.		9250 (flats)	0.25
		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.65c
Hot strip 6 1/16 to 24-in. Pitts.	1.55c
Hot strip, bands 6 in. and under, Chicago	1.75c
Do. 6 1/16 to 24 in.	1.65c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.25c to 2.35c
Worcester, 3 tons, over	2.40c to 2.50c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$46.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off

Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off

Upset 1 in. and smaller ..... 80-10-5 off

Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l., Pittsburgh	2.40c
do, less carloads, 5 kegs or over, 2.65c; and less than 5 kegs, 2.80c.	
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Bars

Improved Demand Appears and Higher Prices Are Sought—Chicago Specifications Gain

BAR PRICES, PAGE 65

Chicago—Bar specifications are ahead of sales. The volume has been varying but bar production is close to that of plates, which have been leading since early in the year. Bar producers claim to be booking more business at 1.75c, Chicago, but due to protections, a base of 1.70c, Chicago mills is quoted. Reports are that further efforts will be made to stiffen prices for second quarter, although attractive orders now might bring out concessions. Soft steel bar operations are 50 per cent and alloy steel bars, 40 per cent. Buying is chiefly in small miscellaneous lots. Automotive releases are lighter this week.

New York—Commercial steel bar demand is showing little gain, although 1.65c, Pittsburgh, continues to rule on new business and 1.60c on contracts. Common iron bars range 1.60c to 1.75c, with the minimum figure the more representative. Business in iron bars is spotty.

Pittsburgh—Better demand for steel bars from automotive buyers is stimulating activity slightly in this market. Incoming business shows a moderate improvement since a month ago despite the small lot character of buying and lack of improvement in some directions. Second quarter inquiry is more active but producers defer announcement of prices. Some interests believe another advance will be sought. The market usually is quoted at 1.65c, Pittsburgh.

Youngstown, O.—Expected gains in production of common steel bars are admitted by producers here to be based upon hopes of extensive state highway construction. Alloy steel bars continue in good demand by auto partsmakers but even this could be improved upon from the tonnage viewpoint. Agricultural implement needs have not taken a definitely improved position as yet but mills are hopeful also of getting some better business from this source shortly if they are going to receive it at all this spring. Demand from nut and boltmakers continues only fair. Bars hold here at 1.65c, Pittsburgh, and appear firm in this district.

Cleveland—Sales of merchant steel bars have improved slightly over the past week, more interest being displayed by a wider variety of consumers. The local price of 1.65c to 1.70c, Cleveland, for both local and outside delivery, is holding nominally. Alloy bars are reported firm from all selling interests at a 2.65c, f.o.b. mill, base. Sellers concur that more interest must be shown in the bar market and orders must be placed in greater amount before a rumored price advance of $1 to $2 a ton could reasonably be expected to be effective.

Philadelphia — Steel bars are steady at 1.65c, Pittsburgh, on new business. Specifications are slightly freer. Common iron bars are quiet at 1.60c, Pittsburgh.

Cold-Finished Steel Bar Interest is Lacking

Cold Finished Prices, Page 65

Pittsburgh — Shipments of cold-finished steel bars hold at a slightly better rate than a month ago while specifications remain quiet and in small lots. Some automotive buyers are placing larger orders while little change is noted in demand from other users. Second quarter inquiry is lacking with the market usually quoted 2.10c, Pittsburgh.

Cleveland—Sellers of cold-finished bars have had a marked absence of inquiry in second quarter from consumers. Books have not been opened yet. Current sales are extremely quiet and the aggregate is much below normal. The 2.10c, Cleveland, base price is named generally.

Plates

Orders Small and Diversified—Output Leads Finished Steel List in Chicago—Prices Steady

PLATE PRICES, PAGE 65

Chicago—Plate mill operations at slightly above 50 per cent are leading heavy finished production, with bar mills a close second. Skelp shipments to the Milwaukee pipe line fabricator average 5000 to 6000 tons weekly, some of this material going into stock pipe for expected early lettings. Several miscellaneous storage tank projects amount to 2000 tons. Oil storage work is more promising, but only about 5000 tons are on inquiry. Several pending pipe line projects may affect adversely contemplated storage work. The base price is 1.70c, Chicago.

New York—Reflecting improved business operations at eastern plate mills now average close to 50 per cent. Demand is diversified. Railroads are specifying more freely and tank business is larger. Prices continue 1.70c to 1.75c, Coatesville, although some sellers are adhering to 1.75c on forward business.

Cleveland — Current orders are dragging, some days being active and others extremely dull. Consumers specify quick deliveries. Sellers have not opened second-quarter books, and report little interest. The 1.65c, Pittsburgh, base holds on forward purchasing but lacks a real test. Plates have been placed for three of the five locomotives recently ordered from Lima Locomotive Co., Lima, O., by the Chicago & Illinois Midland.

Pittsburgh—Plate demand is holding its own at about the January rate. Orders generally are small but are fairly well distributed. Carnegie Steel Co. will supply 3000 tons of sheet piling for twin locks on the Monongahela river. Second quarter price announcement on plates is lacking, with the current market usually 1.65c, Pittsburgh.

Philadelphia—Further slight gain in plate business is noted. Prices are steady. Formal award of two vessels for the Eastern Steamship Co., requiring 4600 tons of plates in addition to 2400 tons of shapes and bars is expected this week. The Newport News Shiobuilding & Dry Dock Co. is low bidder. Approximately 600 tons of plates are required for the submarine V-8, awarded to the Portsmouth navy yard. Private yards have been asked to bid April 16 on the V-9, requiring a similar amount.

Baldwin Locomotive Works has booked five locomotives for Russia and five for the Western Pacific. The two orders require 500 tons of plates.

Contracts Placed

3000 tons, sheet piling, for Monongahela river twin locks at Rostraver, Pa., to Carnegie Steel Co.; Dravo Contracting Co., Pittsburgh, general contractor.

600 tons, dam gates for Rock Island, Wash., power project, to Puget Sound Machinery Depot, Seattle.

250 tons, 1,000,000-gallon elevated riveted steel tank for delivery Cristobal, Canal Zone, to Chicago Bridge & Iron Co., Chicago.

100 tons, boilers for Ford Motor Co. assembly plants at Seattle and Richmond, Calif., to Puget Sound Machinery Depot, Seattle.

Contracts Pending

750 tons, auto ferry for Auto Ferry Co., Coronado, Calif. Bids opened.

350 tons, 24 and 36-inch water main project, Seattle. Bids Feb. 20.

South African Manganese Ore Price Advanced

Iron Ore Prices, Page 76

New York—South African manganese ore has been advanced, 52 per cent material now holding at 26c to 28c per unit in cargo lots, not including duty. Middle grade South African ore, 49 to 51 per cent, with a guaranteed minimum of 48 per cent, is quoted at 25c to 26c; and low-grade South African, ranging 44 to 47 per cent, with a guaranteed minimum of 42, is holding 24c. Caucasian, 52 to 55 per cent, is unchanged at 26c to 28c, with Brazilian, 46 to 48 per cent, nominally 23c. Indian ore, 48 to 50 per cent, is nominal, with no sales reported in some time. Other foreign manganiferous, low phosphorus and basic ores are unchanged.

A sample of the first cargo of South African manganese ore which arrived recently shows the following: Metallic manganese, 52.35 per cent; silica, 6.035; phosphorus, 0.062; and moisture, 0.37. The ore is furnished in crushed lumps between 2 and 4½ inches. This ore is a natural product and does not go through any process of benefication. As the manganese falls the iron rises, so that approximately the total manganese and iron is generally about 57 to 59 per cent.

Cleveland—The Ford Motor Co. has not issued its inquiry for iron ore, and no action is anticipated for several weeks. The Lake Superior Iron Ore association reports consumption and stocks as follows:

	Tons
Ore consumed in December	2,338,824
Ore consumed in January	2,349,522
Increase in January	10,698
Ore consumed in Jan., 1930	4,101,015
Ore on hand at furnaces Feb. 1, 1931	30,430,417
Ore on Lake Erie docks Feb. 1, 1931	6,189,521
Total at furnaces and Lake Erie docks Feb. 1, 1931	36,619,938
Total Feb. 1, 1930	33,528,398

To Buy Instrument Wire

New York—Bids will be opened March 9 by the signal corps, delivery at Brooklyn, N. Y., for 43,500 feet of instrument wire.

Railroads

Track Fastenings Continue Active in West—Several Roads May Scrap Obsolete Cars

TRACK MATERIAL PRICES, PAGE 65

New York—Car demand continues light. Unless the Bessemer & Lake Erie list of 1000 to 1200 cars is placed in the next few days, February promises to be another exceedingly light one in point of car buying. Pennsylvania railroad is taking bids March 5 on 1500 car wheels for passenger, tender and engine truck requirements. These are for delivery to 10 shops. Navy bureau of supplies and accounts takes bids March 3 on one gasoline-engine locomotive for Lakehurst, N. J.

Chesapeake & Ohio is inquiring for 4000 tons of shapes, plates and bars for second quarter needs. This is comparable to its average quarterly requirements. Bessemer & Lake Erie has decided on distribution of 1000 to 1200 hoppers, though no formal award is noted.

Cleveland—Though lacking official confirmation, Nickel Plate is rumored to have allocated its pending rail order calling for 27,400 tons, four ways in the same proportion as its 1930 order. Bethlehem, Inland, Carnegie and Illinois shared in the order, meaning approximately 7000 tons to each of the aforementioned, or about half the order to the United States Steel Corp. Fastenings still are pending. It is understood the inquiry for ten locomotives this road announced last week may be withdrawn.

Chicago—Another heavy week is noted in track fastenings, although sales fell below the 10,000-ton mark for the first time in three weeks. Fresh bookings were about 6000 tons. While it is understood St. Paul railroad will buy about 23,000 tons of rails, no inquiry is out. Last year St. Paul bought over 50,000 tons. That road's locomotive inquiry is understood to have been reduced from 57 to 17 units. Rail mill operations now are slightly above the 50 per cent mark. Chicago & Eastern Illinois railroad is scrapping 7000 to 8000 obsolete cars, and it is understood a number of other carriers are desirous of eliminating outworn equipment if official sanction is obtained. One road is known to be contemplating the junking of 13,000 bad-order cars. Railway Refrigerator Car Corp. is taking bids on 100 refrigerator cars, the order may not be placed at once.

Toronto, Ont.—New rail mill of the Algoma Steel Corp., Sault Ste. Marie, Ont., which was reconstructed at a cost of $1,259,000, went into operation Feb. 16 and is working on an order for 39,000 tons of 130-ton rails.

Car Orders Placed

Sanitary District of Chicago, repairs to 20 air-dump cars, to Ryan Car Co., Chicago.

Locomotives Placed

Soviet Russia, five locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Western Pacific, five mallet-type locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Locomotives Pending

Navy bureau of supplies and accounts, one gasoline-engine locomotive, for Lakehurst, N. J.; bids March 3.

Car Orders Pending

Baltimore & Ohio, five baggage and mail oil-electric rail motor cars.

Kansas City Southern, four baggage and rail cars.

E. H. Wilson & Co., Philadelphia, 20 to 30 all-steel gondola cars of varying capacities.

Rail Orders Pending

War department, Dayton, O., 300 tons light rails; bids Feb. 27.

10,350 tons, 110-pound rails, for Western Pacific, San Francisco.

23,000 tons, 1931 needs, for Chicago, Milwaukee, St. Paul & Pacific; prospective but definite inquiry not yet out.

Tin Plate Specifications and Operations Improve

Tin Plate Prices, Page 65

Pittsburgh—Further improvement is noted in activity in tin plate. Recent specifications are moderately heavier and producers are adding slightly to their backlogs. This is enabling them to schedule operations farther ahead. Output again has increased and currently is a few points above the 70 per cent rate attained a week ago. Tin plate continues $5 per base box, Pittsburgh.

New York—Tin plate operations are being stepped up rapidly, some producers now operating at virtual capacity. The industry averages above 70 per cent. The price is $5 per base box, Pittsburgh. Approximately 650 tons of casing is pending for Japan.

Structural Shapes

Structural Awards Largest Since October—Total of 57,705 Tons Are Placed Including 39,240-Ton Cincinnati Project—Bridgework Figures in Week's Contracts

STRUCTURAL SHAPE PRICES, PAGE 65

New York—Plain structural material holds at 1.65c, Pittsburgh, on new business, which is light as fabricators continue on material contracted for at lower prices. New work is largely confined to public requirements. Pennsylvania railroad and the Delaware, Lackawanna & Western are taking bids for bridge steel, although the tonnage in both cases is not large. Small apartment projects, taking around 100 tons each, continue active. City is asking for bids on Pier 32 which will take about 2000 tons according to estimate.

Boston—The week's only project placed was for 300 tons for a plant of the Edison Electric Co., which was placed with the New England Structural Co. There are no large projects pending.

Philadelphia—While the bulk of shape specifications against contracts is at 1.70c, mill, new business continues to go usually at 1.75c, mill, or 1.81c, Philadelphia. Trading is slightly improved with promise of further although light increase over the coming month. Bids will be taken March 16 for 2000 tons of shapes for extension to the municipal subway on Market street from Thirtieth to Thirty-third streets. Later 6000 tons for South Broad street subway from South street to Oregon avenue will come up, though possibly not before fall.

Buffalo—District fabricators report two orders aggregating 300 tons this week, with several others of fair size pending.

Pittsburgh—Activity in structural steel is slow to expand. Inquiry is deferred on several large jobs in this district while awards are few and in small lots. Specifications for plain material are steady but quiet. Plain material usually is quoted 1.65c, Pittsburgh, with most tonnages applied against lower-priced contracts.

Cleveland—Industrial Brownhoist Corp., Cleveland, has awarded 500 tons of structural steel for its new plant at Bay City, Mich., to Whitehead & Kales, Detroit. Local awards during the week for construction in this immediate district were under 100 tons, and fairly scarce. City will buy 300 tons of shapes March 6 for bridges and the state has several hundred tons pending for highway bridges. Huron road hospital addition plans are nearing completion.

Ohio Edison Public Service Co. will buy 225 tons for a building to be erected at Akron, O., and 100 tons is involved in remodeling work on the L. C. Hanna estate at Mentor, O. Some 1000 tons of shapes will be purchased for docks for the Thunder Bay Quarries Co., subsidiary of Diamond Alkali Co., Fairport, O., to be built at Alpena, Mich. Stark County Dry Goods Co., Canton, O., will take 425 tons of structurals for a building.

Cincinnati—The Cincinnati Union Terminals Co. has awarded 39,240 tons of shapes for its terminal project for bridges, train sheds, and miscellaneous buildings. R. C. Mahon Co., Detroit, took 22,000 tons, McClintic-Marshall Corp., division of Bethlehem Steel Corp., took 17,240 tons.

Chicago—Structural inquiry consists largely of bridge and government work. Plain material is quoted nominally at 1.70c to 1.75c, Chicago, as structural mills still have carryover at a 1.70c protection for a number of specific projects. Inquiries are 2500 to 3000 tons, mostly smaller jobs. Awards are less than 1500 tons.

Birmingham, Ala.—Working time in fabricating shops is being stepped up, 5½ days a week now being normal time. New business is largely in small tonnage. Ingalls Iron Works is now at work on 6000 tons for 10 barges for Inland Waterways Corp.

Awards Compared

	Tons
Awards this week	57,705
Awards last week	10,361
Awards two weeks ago	21,525
Awards this week in 1930	36,880
Av. weekly awards, 1930	35,242
Av. weekly awards, 1931	30,215
Av. weekly awards, Jan.	27,018
Tot. awards to date, 1930	313,359
Tot. awards to date 1931	241,724

Contracts Placed

39,240 tons, requirements for Cincinnati Union Terminal Co., Cincinnati, O. Includes 22,000 tons shapes for train sheds and miscellaneous buildings, to R. C. Mahon Co., Detroit. Bridges taking 17,240 tons, were awarded to McClintic-Marshall Co., Pittsburgh.

2000 tons, apartment, Park avenue and Thirty-fourth streets, New York, to McClintic-Marshall Corp., Bethlehem, Pa., through Geekie Naughton, New York, general contractor.

1575 tons, bridge, Hometown, Pa., for Central Railroad of New Jersey, to Phoenix Bridge Co., Phoenixville, Pa.

1500 tons, bridges in Maine, for Canadian Pacific railroad, to unstated interest.

1475 tons, bridge and trusses, Moosehead, Sask., for Canadian Pacific railroad, to Bethlehem Steel Co., Bethlehem, Pa.

1100 tons, railroad Y. M. C. A., East Forty-seventh street, New York, to Palmer Steel Co., Springfield, Mass., through Barbor & Comeau, general contractor.

1100 tons, Times-Mirror building, Los Angeles to Consolidated Steel Corp., Los Angeles.

1000 tons, Red Cross building, Washington, to Robinson Iron & Steel Co., Philadelphia, through McCloskey & Co., Philadelphia, general contractor.

600 tons, dam gates for Rock Island, Wash., power project, to Puget Sound Machinery Depot, Seattle.

585 tons, power house substructure, Safe Harbor, Pa., for Safe Harbor Water Power Corp., to American Bridge Co., Pittsburgh. Approximately 1400 tons of shapes are still pending on this project. Arundel Corp., Baltimore, is general contractor.

500 tons, power house, Bowling Green, Ky., to Ingalls Iron Works Co., Birmingham, Ala.

500 tons, plant, Bay City, Mich., for Industrial Brownhoist Corp., Cleveland, to Whitehead & Kales, Detroit, through Weber Construction Co.

430 tons, bridge, Beckleysville, Md., to Phoenix Bridge Co., Phoenixville, Pa.

425 tons, addition public school No. 101, Benson avenue, Brooklyn, N. Y., to Hedden Iron Works, New York.

400 tons, unstated projects requiring 200 tons each, to Dominion Bridge Co., Montreal, Que.

400 tons, three 1-story additions, Wholesale Granite Co., Atlanta, Ga., to Converse Bridge & Steel Co., Chattanooga, Tenn.

350 tons, bridge spans for Illinois Central railroad to Virginia Bridge & Iron Co., Roanoke, Va.

350 tons, highway bridge, Galesville, Wis., to Milwaukee Bridge Co., Milwaukee.

300 tons, bridge, LaCrosse, Wis., to Milwaukee Bridge Co., Milwaukee.

300 tons, Junior high school, Irvington, N. J., to Goller Iron Works, Newark, N. J., Louis Deutsch Inc., general contractor.

300 tons, Boston, Edison Electric plant, to New England Structural Co., Boston.

295 tons, Turtle Creek bridge, Beloit, Wis., to McClintic-Marshall Corp., Bethlehem, Pa.

275 tons, 10-room addition, including two gymnasiums. Stewart Junior high school, Washington, to Dietrich Bros., Baltimore; W. P. Rose Co., Goldsboro, N. C., general contractor.

255 tons, building, Baltimore, for H. Weiskittle & Sons Co., to Belmont Iron Works, Philadelphia.
240 tons, chemical building for Detroit, to R. C. Mahon Co., Detroit.
200 tons, apartment, Jackson near Gough street, San Francisco, to McClintic-Marshall Co., San Francisco.
200 tons, school, Ausable Forks, N. Y., to Kellogg Structural Steel Co., Buffalo.
175 tons, alterations, Lutheran hospital, Convent avenue and 144th street, New York, to George A. Just, Long Island City, N. Y.
160 tons, beam spans for Missouri Pacific railroad, to McClintic-Marshall Corp., Bethlehem, Pa.
150 tons, apartment, Ovington avenue, Brooklyn, to Kusel & Eisen, Brooklyn, N. Y.
150 tons, three apartments, Davison avenue and Anderson avenue, Bronx, N. Y., to Prudential Iron Works, Bronx, N. Y.
125 tons, apartment, Kew Gardens, N. Y., to Pecker Iron Works, Brooklyn, N. Y.
115 tons, building, Carbide & Carbon Chemical Corp., South Charleston, W. Va., to American Bridge Co., Pittsburgh.
110 tons, apartment, Bronx, N. Y., to Voepel Iron Works, Bronx, N. Y.
110 tons, derricks, for Taylor-Fitcher Steel Construction Co., to American Bridge Co., Pittsburgh.
100 tons, Mennonite hospital, Bloomington, Ill., to Midland Structural Steel Co., Chicago.
100 tons, jail, Steuben county, N. Y., to R. S. McMannus Steel Construction Co., Buffalo.
100 tons, postoffice, Santa Anna, Calif., to Pacific Iron & Steel Co., Los Angeles.
100 tons, grade separation work, Cooke county, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.
100 tons, state highway bridge, Brooks county, Ga., to McClintic-Marshall Corp., Bethlehem, Pa.
Unstated tonnage, church, Twenty-first avenue, Astoria, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.
Unstated tonnage, 100 tons or more, radio broadcasting tower, Wayne township, N. J., to Breen Iron Works, Newark, N. J.; Blaw-Knox Co., Pittsburgh, general contractor.

Contracts Pending

45,000-50,000 tons, railroad terminal, Montreal, Que., for Canadian National railroad; bids to be called shortly.
15,000 tons, estimated, parcel post building, New York; foundation bids in.
3000 tons, prison building, Attica, N. Y.
2000 tons, subway section, Market street, Philadelphia; bids March 16.
1000 tons, administration building, 369th infantry, 142nd street and Fifth avenue, New York; bids March 11.
1000 tons, docks, Alpena, Mich., for Thunder Bay Quarries Co., subsidiary of Diamond Alkali Co., Fairport, O.
900 tons, bridges for Minnesota highway commission.
505 tons, bridges, New Jersey State highway commission, Bergen county; bids March 9.
500 tons, postoffice addition, South Bend, Ind.
500 tons, First National ramp garage, St. Paul.
500 tons, airport buildings, Lake Ponchartrain, New Orleans; Fuller Construction Co., general contractor.
500 tons, state bridge, Coventry, R. I.; bids March 4.
500 tons, United States army hangar, Hampton Roads, Va.
450 tons, public school No. 120, Queens Borough hill, 136th street, Queens, New York; bids Feb. 26.
429 tons, bridges, Texas state highway commission, Austin, Tex.; bids close Feb. 28.
425 tons, building, Stark County Dry Goods Co., Canton, O.
360 tons shapes, 50 tons reinforcing bars, 325 tons steel castings, Marmet lock, Great Kanawaha river, W. Va.; General Contracting Corp., Pittsburgh, general contractor.
300 tons, bridges including one for West Third street, for Cleveland; bids March 6.
285 tons shapes, 100 tons steel castings, 35 tons reinforcing bars, second Twin City lot, United States engineer, St. Paul; A. Guthrie & Co. Inc., St. Paul, general contractor, $683,599.
250 tons, ring gates for United States bureau reclamation, Denver; Consolidated Steel Corp., Los Angeles, low.
250 tons, county bridge, Sharpstown, N. J., bids March 6.
250 tons, plant building, 144th street, New York, J. W. Williams & Son Co., readvertised for general contract.
250 tons, garage, department of sanitation, Long Island City, N. Y.
200 tons, apartment, East Thirty-seventh street, New York.
154 tons, subway, Santa Ana, Calif.; bids postponed until Feb. 24.
150 tons, Webster street pier, Oakland, Calif.; California Steel Co., Oakland, low.
150 tons, county bridge, Bergen county, N. J.; Brooks Bros., Paterson, N. J., low on general contract.
111 tons, bridge, Ventura county for United States bureau public roads, San Francisco; bids March 10.
110 tons, bridge near Hackberry, Ariz.; bids received.
100 tons, state bridges, Georgia; bids Feb. 24.
100 tons, remodeling work, L. C. Hanna estate, Mentor, O.
225 tons, building, Ohio Edison Public Service Co, Akron, O.
100 tons, state highway bridge, Delaware; bids March 1.
100 tons, state bridge, Dover, Del.; bids March 3.
Unstated tonnage, Mississippi river dam, Rock Island, Ill.
Unstated tonnage, 16 deck-plate girder spans, English lake, Indiana, for Pennsylvania railroad; bids March 5.
Unstated tonnage, bridge, over Trout brook, McGraw, N. Y., for Delaware, Lackawanna & Western railroad; bids March 5.
Unstated tonnage probably in excess of 300 tons, highway bridges for Ohio. Includes one bridge, 200 tons, another 80 tons; bids on all, week of Feb. 23.

Concrete Bars

Reinforcing Bars for Public Construction in East Will be Heavy, 10,000 Tons Pending — Will Revive 5000-Ton Chicago Job—Week's Awards Are Only 3055 Tons

REINFORCING BAR PRICES, PAGE 65

New York—Pending volume in concrete reinforcing bars is heavy, largely for public construction. More than 10,000 tons is active in this area. Nine hundred tons for the West Side elevated highway was expected to be closed this week. Private building is taking few bars and such orders are generally under 100 tons. Prices are steady and unchanged at 1.65c, Pittsburgh, although some reports of shading on several of the more attractive lots is being done.

Boston—Reinforcing bars awards totaled about 100 tons in odd jobs. Prices continue to show a mixed tone, though small tonnages are bringing listed figures.

Philadelphia—Demand is spotty with the leading award in 200 tons for a sewerage development at Norristown, Pa., going to the Concrete Steel Co.

Buffalo—Inquiry for reinforcing bars is increasing, with prospect that a number of good sized contracts will be awarded before the end of the quarter. Second quarter promises to be the most active three-month period in this market in some time.

Pittsburgh—Concrete bar business is steady and fairly active for this period. Orders usually are for small lots and local inquiry is rather light. The Pittsburgh postoffice foundation will require several hundred tons of bars. The market usually is 1.65c, Pittsburgh, for stock lengths.

Cleveland—Two jobs of 200 tons each have been awarded locally, one for the new South High school to Concrete Engineering Co., and the

(*Concluded on Page* 73)

Awards Compared

	Tons
Awards this week	**3,055**
Awards last week	**6,498**
Awards two weeks ago	**6,820**
Awards this week in 1930	**8,430**
Av. weekly awards, 1930	**6,990**
Av. weekly awards, 1931	**7,206**
Av. weekly awards, Jan.	**7,331**
Total awards to date, 1930	**43,769**
Total awards to date, 1931	**57,657**

Strip

Gain in Buying Shown Generally and Higher Price Seems Likely—Production Is Increased

STRIP PRICES, PAGE 65

Youngstown, O.—Hot-rolled strip output is running a close parallel with tin plate production in this district when measured either in tonnage or in percentage of mill capacity now active. While considerable demand continues to come from auto partsmakers yet a constantly growing proportion of the strip mills' output is going into other lines. For instance, literally thousands of tons of Youngstown district hot strip went into the construction of window casing, doors and door-frames, etc., in the Chrysler building in New York. Hot strip, which in this particular shape is known as "buck stock," up to 30-inches in width is being rolled into highly ornamental window frames by specialty concerns located in various parts of the Middle West and East. Before this rolled and formed material finally is folded into its final shape for installation in buildings, it sometimes is coiled into rolls 800 or 900 feet long, which then is cut into lengths as required for particular jobs.

Under the impetus of present sustained good demand, hot and cold strip prices are holding so firmly as to be regarded as the outstanding price feature of the present iron and steel market. Hot-rolled holds at 1.65c to 1.70c, Pittsburgh, depending upon quantity, while cold-rolled is 2.25c to 2.35c, Pittsburgh and Cleveland, also depending upon quantity.

New York—With the possibility of action by producers around the first of next month, interest in the strip market is being focused on prices for second quarter. In view of the fact that business generally has been spotty, some trade interests are doubtful if there will be an advance. On the other hand, with no advance for the current quarter and in view of a probably more active market in second quarter, others would not be surprised if an advance were announced. Meanwhile, hot strip is steady at 1.55c, Pittsburgh, for wide, and 1.65c for narrow. Cold-rolled is firm at a 2.25c, Pittsburgh minimum.

Pittsburgh — Strip steel demand has improved further over the better activity noted recently. Orders this month show a better than seasonal expansion over January activity while operations are moderately higher than a week ago at 50 to 55 per cent. Cold strip production, which for many weeks has held around 25 per cent, now is only slightly below the rate of hot strip production. Automotive interests are more liberal in specifications and a fair gain is noted in demand from other buyers. Second quarter inquiry so far is light and producers have made no decision regarding prices for that period. The market usually is 1.55c and 1.65c, Pittsburgh, for hot-rolled strip and 2.25c for cold-rolled strip.

Philadelphia—Strip business continued in restricted volume, with hot rolled strip 1.55c, Pittsburgh, for wide and 1.65c for narrow. Cold rolled is 2.25c. Early announcement for second quarter is expected by some interests, with the possibility of an advance, particularly for hot rolled strip.

Cleveland—Releases in February have been slightly ahead of January, due largely to both direct and indirect autmotive support. Prices remain firm, consumers purchasing at 1.55c and 1.65c for wide and narrow hot, respectively, and 2.25c, Pittsburgh and Cleveland base, on cold-rolled. Books have not been opened for second quarter contracts.

Chicago—Substantial gains in specifications for hot-rolled strip are being made over the January rate, a Milwaukee automobile frame maker asking heavier shipments. Prices are unchanged and operations have been increased to almost 50 per cent for the district. Cold-rolled operations are 30 to 35 per cent.

Warehouse Sales Steady But Fail to Improve

Warehouse Prices, Page 87

New York—Leading jobbers here are putting into effect a revised list of width and length extras on galvanized sheets to conform with the mill changes recently announced by the American Sheet & Tin Plate Co. Jobber prices otherwise are unchanged. A slight improvement is noted in structurals and reinforcing bars, but some jobbers are doubtful if the rate for this month will show much gain over January.

Boston—Business has dwindled somewhat for warehouse interests, owing to a falling off in odd jobs.

Philadelphia—Warehouse sales are spotty with little likelihood February will show a gain over January. Prices are unchanged.

Buffalo — Warehouse orders continue to improve. First quarter is running considerably ahead of warehouse operators' expectations.

Pittsburgh—Sales are spotty and business lacks a definite trend. Practically all products are seasonally quiet with building materials in light demand. Prices are unchanged with no revisions in immediate prospect. Occasional sharp concessions on bars are noted from the general 2.75c price.

Cleveland—Orders are small with but one or two orders monthly for heavier steel lines from stock running over 50 tons. Aggregate tonnage moving is running slightly in excess of the comparable period in January, though is not up to seasonal expectations. Prices are unchanged.

Cincinnati — Reports from warehouses are without feature, tonnage gains being small. Prices are unchanged.

Detroit—Warehouse business over the past week has shown a better tone. Orders are running to larger amounts. Prices are unchanged.

Chicago—While sales totals show no pickup in orders from a week ago, warehouses report there has been no falling off in buying for three weeks. Until last week, orders have been gaining steadily. Shapes, bars, plates and bolts, nuts and washers are active. Sheet jobbing is slower. Cold-rolled material demand is spotty. Prices remain unchanged.

St. Louis—Warehouse business is holding its own, but conditions are still spotty and irregular. Seasonal lines continue to be adversely affected by the unusually mild and open winter. Some slight betterment is noted in the movement of goods to the rural area. Prices through the entire list are apparently more stable than in a number of months.

Ferroalloy Shipments Better Than in January

Ferroalloy Prices, Page 76

Pittsburgh — Specifications for ferroalloys are fairly steady with a moderate improvement over January. Prices continue $89.79, delivered, for ferromanganese, and $30, furnace, for spiegeleisen. Activity in other ferroalloys has improved moderately since Jan. 1. Prices are steady.

New York—Practically all users of special ferroalloys are under contract, though a few indicated at the beginning of the year they might not commit themselves.

Concrete Bars

(*Concluded from Page 69*)

second for the May Co. department store addition to Bourne-Fuller division of Republic Steel Corp.

Contracts Placed

300 tons, school, Oakland, Calif., to Concrete Engineering Co., San Francisco.

300 tons, Times-Mirror building, Los Angeles, to unstated company.

240 tons, filtration plant, Flint, Mich., to Capitol Steel Corp., Lansing, Mich. W. E. Wood Co., general contractor.

225 tons, grade separation work, Chicago, St. Paul & Pacific railroad, to Truscon Steel Co., Youngstown, O.

225 tons, road mesh, route 48, section 24, McKee City to Tilton road, New Jersey, to National Steel Fabric Co., New York, through Charles D. Prosser, general contractor.

200 tons, Webster street pier, Oakland, Calif. ,to Soule Steel Co., San Francisco.

200 tons, May Co. addition, to Bourne-Fuller division, Republic Steel Corp., Youngstown, O. Aronberg-Fried Co., general contractor.

200 tons, South high school, to Concrete Engineering Co., Cleveland. Aronberg-Fried Co., general contractor.

200 tons, sewerage development, Norristown, Pa., to Concrete Steel Co., New York.

150 tons, Turtle Creek overhead, Janesville, Wis., to Hansen-Beckman & Co., general contractors, Beliot, Wis.

140 tons, disposal plant, Tulsa, Okla., to Sheffield Steel Corp., Kansas City, Mo.

130 tons, buildings, Queens General Hospital, New York, to Kalman Steel Co., Chicago, through J. Kennedy Construction Co.

125 tons, building, University of Indiana, Bloomington, Ind., to Hugh Baker & Co., Indianapolis, Ind.

120 tons, hotel, Wewoka, Okla., for Aldridge Hotel Co., to Capitol Steel & Iron Co., Oklahoma City, Okla., through Barber & Short, contractors, Norman, Okla.

100 tons, Illinois highway work to Calumet Steel Co., Chicago.

100 tons, or more, General Electric Co. wire plant, Euclid, O., to unstated interest; Austin Co., Cleveland, general contractor.

100 tons, oxide plant, Dearborn Chemical Co., 1029 West Thirty-fifth street, Chicago, to Kalman Steel Co., Chicago.

Contracts Pending

6000 tons, Oklahoma, A. R. Losh, highway engineer, Oklahoma City, Okla.

1200 tons, filtration plant, Fort Wayne, Ind.

626 tons, roadwork, Texas highway commission, Austin, Tex.; bids close Feb. 28.

300 tons, dormitory, University of California, Westwood, Calif.; bids being received.

266 tons, foundation, parcel post building, New York; bids in.

200 tons, Dunes Park hotel, Michigan City, Ind.

240 tons, paving in San Joaquin county, Sacramento, Calif.; bids received.

200 tons bridges and underpasses, Jones beach, Long Island, N. Y.; Smith Bros., White Plains, N. Y., general contractor.

198 tons, bridges, Texas highway commission, Austin, Tex.; bids close Feb. 27.

187 tons, roadwork, Texas highway commission, Austin, Tex.; bids close Feb. 28.

167 tons, roadwork, Texas highway commission, Austin, Tex.; bids close Feb. 27.

150 tons, sewerage development, Pottstown, Pa.

150 tons, department of justice building, Washington.

150 tons, postoffice, Camden, N. J., in addition to 800 tons of shapes previously noted.

150 tons, superstructure, Randolph street viaduct over Illinois Central railroad, Chicago.

140 tons, concrete sills and auxiliary work, guard lock, Inland Waterway, Great Bridge, Va.; Merritt, Chapman & Scott Corp., general contractor. Work also includes 65 tons structural steel, 40 tons of steel castings, 10 tons of bolts, also pipe, bronze castings and 22,900 square feet of steel sheet piling.

120 tons, bridgework, Texas highway commission, Austin, Tex.; bids close Feb. 28.

102 tons, subway, Santa Ana, Calif.; bids postponed until Feb. 24.

100 tons, state bridges and roads, Georgia; bids Feb. 24.

100 tons, including 60,000 square feet mesh and 50 tons of structural steel, garage and store house, Maxwell field, Montgomery, Ala.; Smith-Pew Construction Co., Atlanta, Ga., general contractor.

Unstated tonnage, for Cincinnati Union Terminal Co. project, Cincinnati. Sum of $5,000,000 to be expended shortly on new union station.

Pipe

Cast Pipe Pending in Large Volume in East—7000 Tons Steel Pipe Awarded to J. & L.

PIPE PRICES, PAGE 87

New York—A large volume of cast pipe pends in this territory. Fresh inquiry includes 1000 tons of cement lined pipe for Elizabeth, N. J., and about 500 tons for Westchester county. Springfield, Mass., opened bids March 7 on several hundred tons of class E, 4 to 12-inch pipe. Baltimore takes bids this week on several hundred tons, previous bids having been rejected. Prices are unsteady as large orders are up for award. Two oil companies here have issued line pipe inquiries for about 2000 tons each. One project calls for 6-inch pipe, extending 85 miles, and the other for 10 miles of 6-inch and 35 miles of 8⅝-inch pipe.

Boston—While several municipalities are showing some interest they are slow in closing on contract. The price situation remains firm.

Pittsburgh—Pipe producers await closing on several active line pipe projects. The order for the North Central Gas Co. line is expected shortly. Activity in standard pipe remains quiet and steady, only slightly better than a month ago.

Cleveland—Detroit has awarded 1275 tons of steel pipe, unstated size, to Farrar & Tretts Inc., Buffalo. Several local fabricators were bidding on the project.

Chicago—Public utilities are ordering first quarter shipments of cast pressure pipe, and foundries are booking second quarter private business. Chicago delivered prices for 6 to 24-inch sizes are $45.20 to $46.20.

Birmingham, Ala.—Additional lettings, though not specified, are reported received by cast iron pipe manufacturers. No change in base price has been given out.

Contracts Placed

2270 tons, 6 and 8-inch class B pipe, Los Angeles, to R. D. Wood & Co., Philadelphia.

800 tons, 6 and 8-inch class 250 cast pipe for St. Louis to American Cast Iron Pipe Co. and McWane Cast Iron Pipe Co., Birmingham, Ala., previously reported to unstated foundry.

425 tons, 6 to 12-inch, for Laurel, Miss., to American Cast Iron Pipe Co., Birmingham, Ala.

275 tons, 24 to 30-inch for Ford assembly plant, Seattle, divided between United States Cast Iron Pipe Co., Seattle, and French interests.

100 tons, 2 to 8-inch class 150, improvement of River avenue, Newport Beach, Calif., to unnamed interest.

Unstated tonnage, 4320 feet, various sizes, bureau of yards and docks, navy department, Hampton Roads and f.o.b. works, to United States Pipe & Foundry Co., East Burlington, N. J.; 2160 feet pending for San Francisco.

Steel Pipe Placed

7000 tons, 10-inch oil line in East Texas, 70 miles for Magnolia Petroleum Co., Dallas, Tex., to Jones & Laughlin Steel Corp., Pittsburgh.

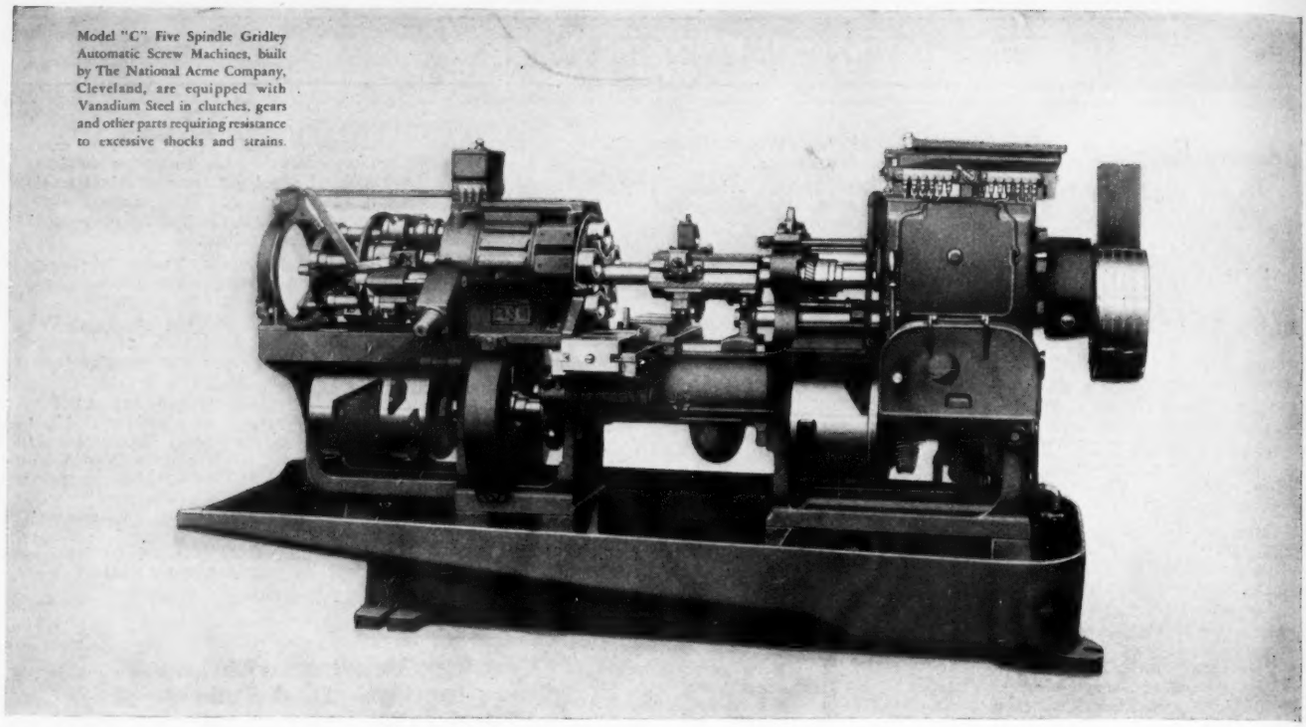
1275 tons, unstated size, for Detroit, to Farrar & Tretts Inc., Buffalo, N. Y.

100-mile steel pipe line for Pecos Valley Gas Co. for installation in Texas, to reported unstated interest.

Contracts Pending

4000 tons, up to 30-inch and fittings, yard stocks, Bronx, N. Y.; bids Feb. 24. United States Pipe & Foundry Co., Burlington, N. J., Warren Pipe & Foundry Co., Phillipsburg, N. J., and Donaldson Iron Co., Emaus, Pa., low.

3000 tons, yard stocks, Queens, New



Model "C" Five Spindle Gridley Automatic Screw Machines, built by The National Acme Company, Cleveland, are equipped with Vanadium Steel in clutches, gears and other parts requiring resistance to excessive shocks and strains.

Where Parts Failures Mean Machine Failures . . .

Vanadium Steels Safeguard Operating Dependability In Gridley Automatic Screw Machines

As the indexing mechanism of Gridley Automatic Screw Machines turns over and is brought to a sudden stop, the small locking pin for the spindle carrier holds the mechanism in position. High impact, shock and strain are imposed on the locking pin.

Similarly severe operating conditions test the stamina of threading clutches, threading gears and finger holder thrust pins of Gridley Screw Machines. To insure dependability in such important units, The National Acme Company employs durable and dependable Vanadium Steels. Service has demonstrated their toughness and resistance to repeated shocks and stresses.

Are there parts of your product where higher strength, toughness and shock-resistance would improve operating dependability? Our Metallurgists, who have assisted many manufacturers in the selection of suitable steels for a wide variety of applications, will gladly cooperate with you. Write us.

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of vanadium, silicon, chromium and titanium; silico-manganese, tungsten and molybdenum, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

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120 BROADWAY, NEW YORK, N. Y.

CHICAGO *Straus Bldg.* PITTSBURGH *Oliver Bldg.* DETROIT *Book Tower*

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research & Development Laboratories, Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability

York; bids March 6.

3000 tons, 42-inch class B and C for East Eightieth street improvement, Seattle; bids Feb. 20.

2246 tons, 8 and 12-inch class B, Los Angeles; bids opened

2000 to 2500 feet, 30-inch cast water pipe, Erie, Pa.; bids soon.

1000 tons, 30-inch cement lined, cast iron pipe, for Elizabeth, N. J.; bids Feb. 24.

887 tons, for village of Whitefish Bay, Milwaukee postoffice, Wis., to Glamorgan Pipe & Foundry Co., Chicago.

500 tons, 16 to 24-inch, cast iron pipe, Westchester county sanitary sewer commission, mostly for New Rochelle, N. Y.; bids Feb. 27.

328 tons, 10 and 14-inch class B, improvement Lomita Park district, Redwood City, Calif.; bids March 16.

250 tons, 4, 6, 8, and 10-inch cast pipe for Grafton, Wis.; bids Feb. 21.

Includes 757 tons 16-inch, 121 tons class C, both at $40.30; 5 tons 6-inch, 4 tons 8-inch both at $41.30. United States Pipe & Foundry Co. made flat bid of $42.40 on all sizes; American Cast Iron Pipe Co. and James B. Clow & Sons both made flat bid of $$45.40 on all sizes.

Steel Pipe Pending

2000 tons, approximately, 85-mile line of 6-inch steel pipe for an unnamed oil company.

2000 tons, approximately, comprising 35 miles of 8⅝-inch steel pipe and 10 miles of 6-inch steel pipe for an unnamed oil company.

Semifinished Market Slow; Prices Untested

Semifinished Prices, Page 76

Pittsburgh—The market for semifinished steel shows little life. Orders for rerolling billets, slabs and sheet bars are no heavier than early in February while demand for forging billets has moderated slightly. The market for the latter is receiving little test and continues $36, with rerolling material $30. Wire rods are quiet, the price continuing $35.

Philadelphia—Demand for semifinished steel is quiet, and prices are unchanged.

Youngstown, O.—Improvement in demand for hot and cold-rolled strip has brought out a slightly better demand for billets from nonintegrated mills, but the irregular operation of independent sheet mills has kept down the demand for sheet bars. Shipments from producing mills are fair. Billets, sheet bars and slabs are holding to $30, Youngstown and Pittsburgh.

Chicago—Semifinished steel shipments are irregular, although a shade above January. Billets and blooms, 4 x 4-inch base, are $31, Chicago. Forging billets are based on $36, Chicago, differentials being added according to grade.

Wire

Price Advance for Second Quarter Forecast—Demand Shows Gain in Most Centers

WIRE PRICES, PAGE 65

Pittsburgh—Intimations are heard of a probable advance in prices of wire products for second quarter. Quotations were depressed sharply last year and even with a large increase over present operations of about 35 per cent it seems unlikely that business would emerge far from its current profitless status. For this reason producers are expected to attempt to regain some of the price margin lost in 1930. The market now is fairly steady at $1.90 to jobbers for wire nails, 2.20c to 2.30c for plain wire and $35 for wire rods. Wire rods continue quiet but a mild improvement is noted in demand for other products. Activity in barbed is expanded in the South.

Worcester, Mass.—Lacking anything definite in production totals, manufacturers perceive improved sentiment. To this they are looking for seasonal improvement to bring the production rate above 50 per cent, where it has remained for several months. Prices, however, are holding. Plain bright wire to dealers remains at 2.40c, base, Worcester.

New York—A further improvement in wire demand is noted, with plain bright wire holding firmly at 2.20c, Pittsburgh. The navy department recently opened bids on a large assortment of wire. Nails have failed to reflect the improvement in wire. Nails are $1.90, Pittsburgh, to jobbers and $2 to the general trade.

Cleveland—Sales of wire and wire products have not increased materially over the past week and further price weakness has been rumored strongly in nails, $1.85 being reported but without confirmation from any seller. Plain wire continues at a minimum of 2.20c; spring wire at 3.20c, Pittsburgh and Cleveland base.

Chicago—February shipments of wire products were ahead of January, and about 20 to 25 per cent above February, 1930. This does not mean that wire business is near normal, as a year ago jobbers and dealers had comfortable stocks compared with the bare floors of jobbers at the beginning of this month. Woven fencing orders are picking up, indicating that spring business may be at or above the average of the last three years' spring business. Occasional weak delivered prices for common wire products are claimed to result from lower rates on river shipments.

Sydney, N. S.—Dominion Steel & Coal Corp. has booked an order for 20,000 kegs of nails. This will keep 100 mill workers employed three days a week and 50 wiremakers two days a week for eight weeks.

Bolt, Nut, Rivet Demand and Specifications Light

Bolts, Nuts, Rivets Prices, Page 65

Pittsburgh — Demand for bolts, nuts and rivets continues spotty and lacks an upward trend. Business this month is off slightly from the January volume. Railroads are indifferent buyers and specifications from jobbers continue light. Mill operations are unchanged and prices continue 73 off for bolts and nuts and 2.75c for large rivets.

New York—Interest among bolt and nut manufacturers is centered in an inquiry for 400 tons of bolts and tie rods for the New Orleans municipal airport. General demand remains quiet with 73 off list easy. Foreign material is a depressing factor, being offered at 73 plus 20 on a limited although popular range of sizes. Foreign sellers are bidding particularly for structural business, offering ¾-inch diameter, 1¼ to 3 inches long; ⅝-inch diameter, 1¼ to 2½ inches; and ½-inch diameter, 1¼ to 2½ inches. Continued lack of jobber specifications is keenly felt by producers generally. Eastern bolt and nut plants are operating at not more than 35 per cent of capacity. Rivets are easy at 2.75c, Pittsburgh.

Philadelphia—Nut and bolt manufacturers are figuring on 300 tons for 57 hangars pending for the war department at Dayton, O. It includes bolts ¾-inch in diameter in three lengths and washers. Prices of bolts are easy at 73 off and rivets at 2.75c, Pittsburgh. Buying is generally quiet.

Chicago—Orders for bolts and nuts are satisfactory on the basis of specifications that has prevailed this year. Small rivets, 7/16-inch and smaller, are showing firmness at 70 to 70, 10 and 5 off list, while 2.85c, Chicago, for large structural rivets is nominal in view of light buying. Occasional concessions by jobbers for nuts and bolts have not become general. Several western tractor makers are filling depleted stocks for dealers, and are advancing specifications.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$17.50
Pittsburgh, dist. fur.	17.00
Pittsburgh, delivered	17.63 to 18.13
Valley furnace	16.50
Cleveland fur., local del.	17.50
Philadelphia, delivered	17.76
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	19.91 to 20.91
Buff., all-rail Newark	18.28 to 18.78
Ala., Bir. fur., local del.	13.00
Alabama, del. Chicago	16.51 to 17.01
Alabama, del. St. Louis	14.92 to 15.42
Alabama, del. Cincinnati	14.19 to 14.69
Ala., Phila., dock del.	15.75 to 16.25
Ala., Balt., dock del.	15.50 to 16.00
Ala., Balt., dock del.	15.50 to 16.00
Alabama, New York dock	16.00 to 16.50
Ala., Boston dock del.	16.25 to 16.75
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cinn.	14.19 to 14.69
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	18.00
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	18.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	19.00
Eastern, del. Phila.	18.76 to 19.26

MALLEABLE

Valley furnace	17.00
Cleveland fur., local del.	17.50
Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Chicago, furnace	17.50
Buffalo fur., local del.	18.00
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13
Eastern Penn., del.	17.25 to 17.75
Buffalo fur., local del.	17.00
Montreal, delivered	20.50
Valley, furnace	16.50

BESSEMER

Valley furnace	17.00
Pittsburgh, delivered	18.13 to 18.63
Pittsburgh, furnace	17.50

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 27.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.00 to 16.50
Pittsburgh district fur.	16.50 to 17.00
Pittsburgh, delivered	17.13 to 17.63

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$26; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50
Connellsville foundry	3.25 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo, ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	9.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	9.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.25 to 12.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52%	26 to 28 cents
South African, 49-51%	25 to 26 cents
South African, 44-47%	24 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	23 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$30.00
Pittsburgh, bessemer	30.00
Youngstown	30.00
Cleveland	30.00
Philadelphia	35.30 to 36.30
Chicago	31.00
Forging, Chicago	36.00
Forging, Pittsburgh	36.00
Forging, Philadelphia	40.30 to 41.30

SHEET BARS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00
Chicago	31.00

SLABS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$14.00
Washed gravel, import duty paid east, tide, gross ton	19.00 to 19.50

ACME

Hot and Cold Rolled Strip
Nirosta Chrome Nickel Strip
Electro Galvanized Strip

• • • •

Long Length Coils
or Cut-to-Length

ACME STEEL COMPANY

General Offices: 2832-40 Archer Avenue .. Chicago

BROOKLYN DETROIT MILWAUKEE SAN FRANCISCO

STEEL

44

Pig Iron

Market Most Active in Lakes Area, with Shipments to Automotive Industry Increasing

PIG IRON PRICES, PAGE 76

Pittsburgh—Little change is noted in the quiet conditions prevailing in the pig iron market since Jan. 1. New business fails to improve while shipments are holding to about the January rate. Recent price concessions have not stimulated buying. orders remaining small and for current needs. Inquiry is lacking, with no interest in the second quarter. Prices generally are on the basis of $16.50, valley, for No. 2 foundry and basic, and $17 for bessemer and malleable.

Boston—Sales in the New England district in the past week did not total 1000 tons. Few inquiries are noted.

New York—Pig iron buying remains spotty. Buffalo iron continues at a minimum of $15, furnace, on deliveries to this district. Mystic Iron Works, Everett, Mass., is a strong competitive factor, with deliveries being offered by truck in the Newark, N. J., territory at $17.25. Recently the last of three barge loads of iron was delivered to the company's storage yards at Kearny, N. J. The New York Central is inquiring for a carload of foundry iron. General Fire Extinguisher Co. is inquiring for 1000 tons for Providence, R. I.

Buffalo—Sales and inquiries continue small. Only four stacks in this district are in blast. Prices are steady.

Youngstown, O.—The 50-cent price reduction by two valley pig iron producers has not brought out much business. The new quotations are $16.50, valley, for No. 2 foundry and basic, and $17 for bessemer and malleable. However, other furnace producers quote $17 on foundry and basic and $17.50 on bessemer and malleable. Sales are small.

Cleveland—The reduction to $16.50, base, valley, as announced in STEEL, Feb. 19, has had no effect on the market here, as with $1.76 freight added the delivered price, $18.26, still is 26 cents above the Cleveland furnaces' local delivered price. Some low prices, however, have been named recently on Cleveland iron for outside shipment, and it was to meet competition that valley furnaces say they revised their quotations. Lake furnace prices for shipment outside of Cleveland, Toledo and Detroit range from $16 to $17. The market continues quiet, with sales at approximately 8000 tons for the week. The rate of shipments is gaining steadily, activity in the Michigan motorcar industry being an important factor.

Cincinnati—An Ohio melter purchased 1000 tons of northern iron, with delivery extending into second quarter, bringing sales in this district in the past week to 4500 tons. Southern iron is offered at $10.50, base, Birmingham.

Philadelphia—Foundry iron is easy at $17.76, Philadelphia. Other prices are steady. Little business is appearing. The navy department is inquiring for 255 tons of low phosphorus and 50 tons of charcoal iron.

Chicago—Except for active deliveries the pig iron market is quieter. More inquiries are out for second quarter and buying may be well under way in two weeks. Resales are light and confined chiefly to small lots of dock iron and some offerings of higher silicon from steelworks. The base grade is steady at $17.50, Chicago furnace. Sales of several carloads of southern iron are noted. Southern makers are seeking to stiffen the market at a minimum of $10.50, base, or $16.50, delivered, Chicago, with full differentials.

St. Louis—The melt is increasing gradually and shipments are steady. Sales in this district during the past week totaled 3000 tons.

Birmingham, Ala.—The market is quiet and prices are unchanged. Six stacks in Alabama are making foundry iron, four basic and one special.

Toronto, Ont.—A stronger demand for merchant pig iron again featured the Canadian markets during the week. Individual sales are larger than earlier in the year.

Operations Gain Slight; Average 53 Per Cent

Youngstown, O.—Steel plant operations are unchanged this week at 50 per cent of capacity with individual companies still reporting widely divergent activities. Sheet, strip and tin mill operations in the district were somewhat higher but a 5 per cent reduction in the schedule of Youngstown Sheet & Tube Co. prevented the industrial average from moving upward. Sheet & Tube's schedule for this area is at 35 against 40 per cent last week. Republic Steel Corp. operations showed a further gain of three points to 58 per cent. Sharon Steel Hoop Co., by placing all its sheet mills in Youngstown in operation, lifted its operating rate to 73 per cent of capacity, a three point gain over the estimated figure of 70 per cent for last week. Ingot production is holding at 50 per cent for this company and the strip department at Sharon, Pa., is operating about 60 per cent. Carnegie Steel this week maintained the 50 per cent schedule held by the company's plants in this district for several months. Newton Steel Co. activity at its Ohio plant is unchanged at 70 per cent.

Philadelphia—Eastern ingot operations at 52 to 53 per cent capacity this week are up one point from last week. A leading producer is at 56 per cent, a gain of one to two points.

Buffalo—District steelworks continue this week at 59 per cent of open-hearth capacity.

Pittsburgh—Ingot operations continue between 45 and 50 per cent of capacity. Blast furnace schedules are unchanged with 18 of 54 steelworks' stacks in the district active. Further gains are noted in finishing mill operations, tin plate and sheets being up a few points at slightly above 70 and 40 respectively. Strip output has advanced 50 to 55 with pipe mill continuing at 35.

Cleveland — Active open-hearths are up one and ingot production is up three points this week to 53 per cent capacity. Eighteen of 34 furnaces of the district are pouring, 13 of which are independents. Local sheet plant of Empire Steel Corp. continues with four of six mills on.

Chicago—Despite reduced operations Feb. 23 ingot production for the district is unchanged at only slightly below 50 per cent this week. Sheet mills made further gains but otherwise finishing mill activity has made little advance. Of the district's 36 steelworks blast furnaces, 14 are active. It is probable that a banked furnace may go in shortly at Gary, Ind.

Birmingham, Ala. — Operating average for the district is unchanged at 65 per cent of capacity, 16 out of 23 open-hearth furnaces being in operation.

Foreign Fluorspar Steady

Fluorspar Prices, Page 76

New York—Despite concessions on domestic material, the market on foreign fluorspar continues $19 to $19.50, duty paid, per gross ton, 85 and 5 per cent. Sellers report little variations in demand, which has been seasonally sluggish for some time.

Scrap

Little Movement and Prices Yield Slightly—Strength Is Evident Beneath Surface

Chicago—While leading grades of steel scrap are holding their own in a quiet market, consumer sales have developed lower prices in several specialty grades, 2 and 3-foot broken rail ends, iron arch bars and axles, and light forge scrap. Vigorous efforts are being made by dealer interests to hold prices in the face of buyer resistance to fresh orders at attractive quotations, as it is realized that prices are below actual costs of collection and preparation. Despite lack of buying, and the limited shipments to large melters, little distress scrap appears. Some views are that conditions are favorable for a price increase next month, as it is indicated district steelworks operations may reach 60 per cent by March 15. Uncertain credit conditions have held

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	9.50 to 11.00
Boston, dealers	6.75 to 7.00
Buffalo, No. 1	11.00 to 11.50
Buffalo, No. 2	9.50 to 9.75
Chicago	9.75 to 10.25
Cinci., deal.	9.50 to 10.00
Cleve., No. 1	10.00 to 10.50
Cleve., No. 2	9.75 to 10.00
Det., No. 1 deal.	9.50 to 9.75
Det., No. 2 deal.	7.00 to 7.50
E. Pa. del. mill	10.00 to 11.00
N. Y. del. R. R.	7.00
N. Y. deal. No. 2	5.50
N. Y., deal. yd.	5.00
Pitts., No. 1	12.50 to 13.00
St. L. No. 1 sel	10.50 to 11.00
Federal, Ill.	9.25 to 9.75
Granite C., Ill.	8.75 to 9.25
Valleys, No. 1	12.00 to 12.50

COMPRESSED SHEETS

Buffalo, dealers	9.50 to 9.75
Chicago	8.50 to 9.00
Cleveland	9.00 to 9.25
Detroit, dealers	9.25 to 9.75
E. Pa. new mat	9.00 to 10.00
Pittsburgh	12.75 to 13.25
Valleys	12.00

BUNDLED SHEETS

Buffalo	7.00 to 7.50
Cinci., deal.	8.75 to 9.25
Cleveland	7.00 to 7.25
Eastern Pa.	9.00
Pittsburgh	11.50 to 12.00
St. Louis	5.50 to 6.00

SHEET CLIPPINGS LOOSE

Chicago	5.00 to 5.50
Cincinnati	5.00 to 5.50
Detroit, dealers	6.00 to 6.50
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	12.00 to 12.50
Boston, dealers	5.50 to 7.00
Buffalo	13.75 to 14.25
Chicago (3 ft.)	11.00 to 11.50
Chicago (2 ft.)	12.00 to 12.50
Cinci., deal.	14.25 to 14.75
Detroit, deal.	12.50 to 13.00
Pitts. (open-hearth, 3 ft. and less)	14.50 to 15.00
St. Louis	13.00 to 13.50

STOVE PLATE

Birmingham	8.00 to 8.50
Boston, con.	8.00 to 8.50
Buffalo	9.50 to 10.00
Chicago, net	7.75 to 8.25
Cinci., deal. net	5.25 to 5.75
Det., net, deal.	6.25 to 6.75
Eastern Pa.	9.00 to 9.50
N. Y., deal. mill	4.75
St. Louis	8.00 to 8.50

COUPLERS, SPRING

Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Eastern Pa.	16.50
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Chicago	11.00 to 11.50
St. Louis	9.50 to 10.00

LOW PHOSPHORUS

Buff., billets and bloom crops	15.00 to 15.50
Cleveland bil. and bloom crops	16.50 to 17.00
Eastern Pa.	17.00
Pittsburgh billet bloom crops	17.50 to 18.50
Pitts. sheet bar crops	16.50 to 17.00

FROGS, SWITCHES

Chicago	10.50 to 11.00
St. Louis	10.00 to 10.50

SHOVELING STEEL

Chicago	9.75 to 10.25
Cleveland	6.50 to 7.00
St. Louis	9.25 to 9.75

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	8.50 to 9.00
Buffalo, No. 2	10.75 to 11.25
Chicago, No. 1	9.00 to 9.50
Chicago, No. 2	9.75 to 10.25
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	11.00
N. Y., No. 1 deal.	10.00 to 10.50
Pitts., No. 2	12.50 to 13.00
St. Louis, No. 1	7.50 to 8.00
St. Louis, No. 2	9.25 to 9.75

SPECIFICATION PIPE

Boston	6.50 to 7.00
Eastern Pa.	11.50 to 12.00
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	9.50 to 9.75
Chicago, No. 1	8.00 to 8.50
Cinn., No. 1 dl.	8.00 to 8.50
Cinn., No. 2	4.50 to 5.00
Cleve., No. 2	6.50 to 7.00
Det., No. 1 new deal.	8.25 to 8.75
St. L., No. 1	7.00 to 7.50
Val. new No. 1	11.00 to 11.50

MACHINE TURNINGS

Birmingham	7.00 to 7.50
Boston, dealers	2.00 to 2.50
Buffalo	6.00 to 6.50
Chicago	4.25 to 4.75
Cinn., deal.	4.50 to 5.00
Cleveland	4.75 to 5.25
Detroit	4.25 to 4.75
Eastern Pa.	7.00 to 7.50
N. Y., deal.	3.00
Pittsburgh	7.75 to 8.00
St. Louis	4.00 to 4.50
Valleys	8.50 to 8.75

BORINGS AND TURNINGS For Blast Furnace Use

Boston	2.00 to 2.60
Buffalo	6.75 to 7.25
Cinn., deal.	4.50 to 5.00
Cleveland	7.00 to 7.25
Detroit, deal.	5.50 to 6.00
Eastern Pa.	6.00 to 7.00
N. Y., deal.	3.00
Pittsburgh	7.50 to 8.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	7.00 to 7.50
Boston, chem.	9.10 to 9.60
Boston, deal.	2.00 to 2.50
Buffalo	6.75 to 7.25
Chicago	4.50 to 5.00
Cinn., deal	4.50 to 5.00
Cleveland	7.00 to 7.25
Detroit, deal.	5.25 to 5.75
Eastern Pa.	7.00 to 7.50
E. Pa., chem.	13.50 to 14.50
N. Y., deal.	3.50
Pittsburgh	7.50 to 8.00
St. Louis	6.50 to 7.00

PIPE AND FLUES

Cinn., deal.	7.50 to 8.00

RAILROAD GRATE BARS

Buffalo	7.25 to 7.75
Chicago, net	7.00 to 7.50
Cincinnati	7.00 to 7.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	6.00
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston, deal.	5.50 to 6.10
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	8.00 to 8.50
Detroit	7.75 to 8.25

FORGE SCRAP

Boston, del.	5.25 to 5.75
Chicago	13.50 to 14.00
Eastern Pa.	10.50 to 11.00

ARCH BARS, TRANSOMS

Chicago, net	10.50 to 11.00
St. Louis	11.50 to 12.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	10.50 to 11.00
Chi., steelworks	7.50 to 8.00
Cleveland	8.00 to 8.50
Eastern Pa.	11.00
Pittsburgh	11.50 to 12.00
St. Louis	7.50 to 8.00

STEEL CAR AXLES

Birmingham	14.00 to 14.50
Boston, ship. pt.	14.00 to 15.00
Buffalo	15.50 to 16.00
Chicago	14.00 to 14.55
Eastern Pa.	18.50 to 19.50
St. Louis	14.50 to 15.00

SHAFTING

Bos., ship. pt.	13.00 to 13.50
Chicago	12.90 to 13.45
N. Y., deal.	13.00 to 14.00
St. Louis	12.00 to 12.50
E. Penna.	18.00

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	13.50 to 14.00
Chicago, iron	10.75 to 11.25
Chi., roll steel	13.50 to 14.00
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	15.50 to 16.00
E. Pa. iron	13.50 to 14.00
Pitts., iron	13.50 to 14.00
Pitts., steel	16.00 to 16.50
St. Louis, iron	10.00 to 10.50
St. Louis, steel	13.00 to 13.50

NO. 1 CAST SCRAP

Birming., cup.	9.50 to 10.00
Buffalo (mach.)	10.50 to 10.75
Boston, textile	9.00 to 9.50
Chicago, mach.	10.65 to 11.20
Chi., railroad	10.10 to 10.65
Chicago, agri.	9.50 to 10.10
Cinn., mach. cup., gross	13.00 to 13.50
Cleve. cupola	12.00 to 12.50
Det., net deal.	8.50 to 9.00
E. Pa. cupola	13.00
N. Y. cup. deal	8.00 to 8.50
N. Y., del. local foundries	12.00
Pitts., cupola	12.50 to 13.00
San Fran., del.	13.50 to 14.00
Seattle	8.50 to 9.00
St. L. No. 1 ma	9.75 to 10.25
St. L. No. 1	9.00 to 9.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast	11.50 to 12.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	6.50 to 7.00
Eastern Pa.	11.00
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.00 to 7.50
Pittsburgh	9.50 to 10.00

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	12.00 to 12.50
Chicago, agri.	10.50 to 11.00
Chicago, R. R.	12.00 to 12.50
Cinn., R. R. dl.	11.50 to 12.00
Cinn., agri., dl.	12.00 to 12.50
Cleve., rail	12.00 to 12.50
Det. auto deal.	11.00 to 11.50
St. Louis, rail	10.50 to 11.00

RAILS FOR ROLLING 5 feet and over

Birmingham	11.25 to 11.50
Boston	8.50 to 9.00
Buffalo	10.25 to 10.75
Chicago	12.00 to 12.50
Eastern Pa.	13.00 to 13.50
New York	9.00 to 9.50
St. Louis	10.75 to 11.25

LOCOMOTIVE TIRES

Chicago, cut	13.00 to 13.50
St. L. No. 1	11.00 to 11.50

LOW PHOS. PUNCHINGS

Chicago	11.25 to 11.75
Buffalo	14.00 to 14.50
Eastern Pa.	15.50 to 16.50
Pittsburgh	15.50 to 16.00

Outstanding

QUALITY
STRENGTH
ACCURACY

WEST STEEL dependability meets the most rigid requirements of manufacturers whose products must stand constant, severe strain.

Our modernly equipped foundry, with a capacity of 500 tons per month of electric steel, is supervised by a staff of experts whose achievements in maintaining unvarying quality and fine finish are commended by all who know WEST STEEL castings.

For years we have specialized on light steel castings in production quantities.

THE WEST STEEL CASTING CO., *Cleveland, Ohio*

WEST STEEL
QUALITY SERVICE

—BETTER STEEL CASTINGS—

back sales to a number of smaller melters.

Boston—The scrap market is unchanged. In the past week prices held firm but there is no indication of a buying movement developing. Outside inquiries are few and local foundries are taking little.

New York—Steel and iron scrap is slightly more active and prices are firmer. Mill inquiry is better and more sales are being made, well spread in small lots. An eastern Pennsylvania mill is reported to have bought a large tonnage of railroad scrap from a southern line, but this is not confirmed.

Philadelphia—Sentiment in steel and iron scrap is easy and trading generally is quiet. Bethlehem Steel Co. has bought 500 to 600 tons of two grades of forge fire at $10 and $10.50, delivered, Coatesville, Pa., a reduction. Other grades are unchanged.

Buffalo—Bethlehem Steel Co. is understood to have completed a purchase of scrap for delivery at Lackawanna at $11 for No. 1 heavy melting steel and $9.50 for No. 2. Only material prepared in yards of dealers sharing in the contract can be delivered on this and future orders from this source. The sale has fixed minimum quotations here and has caused dealers to advance their nominal price lists fractionally on heavy melting steel and substitutes.

Bethlehem Steel Co. has bought 1000 tons of hydraulic compressed sheets at $8, delivered, Lackawanna. This represents a departure in policy by this consumer, who has been out of the market on this grade for a considerable time.

Pittsburgh—Steel and iron scrap continues quiet but fairly steady in price. Some additional buying of heavy melting steel has been done at $13. Compressed sheets are strong and are quoted slightly above heavy melting steel in spite of lack of buying. Machine turnings are in light supply at current prices. The Pennsylvania railroad again is offering 23,000 net tons of heavy melting steel and rails on which bids were rejected in the previous monthly list.

Cleveland—A large consumer of iron and steel scrap has released shipments on blast furnace material on a moderate scale. As a result, slightly higher prices for this material have developed. Cast iron borings and mixed borings and short turnings are quoted higher at $7 to $7.25 as is No. 2 busheling at $6.50 to $7. Shipments are still being held up on steelmaking grades and scrap for foundry use is moving slowly. Melting steel and compressed sheets are moving in fair volume to Warren, O. Youngstown mills continue to restrict shipments.

Some of the iron ore producers here are keeping a close watch on the scrap market for the effect price trends and demand may exert on ore prices and demand this season.

Detroit—On freer movement of steel and iron scrap prices have been reduced slightly, weakness following increased activity of producers.

Cincinnati—Steel and iron scrap is dull and prices unchanged. Dealers' quotations on a few items are lower, an indication of low demand. Machinery and railroad cast are off 50 cents. Short steel rails are now quoted at $14.25 to $14.75, a cut of 50 cents. No. 1 locomotive tires are also off 50 cents, at $10.50 to $11. There is virtually no market for No. 2 busheling.

St. Louis—Iron and steel scrap is quiet with neither buyers nor sellers eager. While the immediate price trend is easier, consumption is gradually gaining and sentiment is fairly hopeful. Heavy melting steel was reduced a further fraction to $8.75 to $9.25, which is a new low, the cheapest price in recent years. Guard rails and rails for rolling were also subject to fractional cuts.

Birmingham, Ala.—Heavy melting steel is moving intermittently and other old materials find outlet less frequently. Heavy melting steel is firm at $11 for best grades with general run as low as $9.50. Prices are steady.

Toronto, Ont.—According to both Toronto and Montreal dealers demand for iron and steel scrap is picking up and sales for the past week made a high record for the year. Mills still buy sparingly, but there is some demand for steel scrap from other melters. The principal improvement is in iron grades. No. 1 machinery cast is in active demand, while malleable grades are improving, and sales of stove plate, while spotty, are more numerous. Dealers are still out of the market.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Coke

Foundry Demand Shows No Further Gains—Furnace Shipments Light—Domestic Dull

COKE PRICES, PAGE 76

Pittsburgh—Beehive coke demand is practically unchanged from a week ago. Foundry operations show no further improvement, while furnace fuel consumption is as light as formerly. Small orders for the latter grade generally bring $2.50. Demand for domestic and heating coke is quieter, due mainly to weather conditions.

Boston—Interest in the market is limited to domestic grades. Prices are steady.

New York—While distress lots are offered occasionally, the usual minimum on beehive furnace coke is $2.50, Connellsville, Pa., with the range up to $2.65. Beehive foundry coke is $3.50 to $3.75 for standard grades, and $4.70 to $4.85, Latrobe, Pa., for premium brands. Foundries still are operating at 45 per cent and little increase in demand is noted. By-product ovens are operating at reduced rates keeping stocks fairly limited. By-product coke prices are unchanged.

Cincinnati—Specifications for by-product foundry coke show little change. The price remains $9, delivered, Cincinnati.

Chicago—By-product coke shipments this month are gaining about 5 per cent over January. The price continues $8, ovens.

St. Louis—Shipments of metallurgical coke are holding to the January and early February average, and one important producer reports a slight gain. New business continues in small volume, and production is slower.

Birmingham, Ala.—Five hundred of 1390 by-product coke ovens in this district are in operation. The market is quiet.

Pacific Coast

Slack Building Activity Limits Demand for Reinforcing Bars —Imports of Steel Hurt Domestic Selling—Pipe Offers Most Marked Demand—Prices Steady in Absence of Test

Seattle—Steel awards in the Pacific Northwest were not large and were confined to structurals, plates and cast iron pipe. Reinforcing materials are inactive and no important tonnages of concrete bars are pending. Business in this section is not making rapid recovery but there is a better undertone, although spring trade is opening slowly. Mill prices of steel products are unchanged but there has not been sufficient inquiry for large tonnages to test their firmness.

Pig Iron and Coke

Foundry activity has improved little since the first of the year. Depression in lumber and fishing is being felt by foundry operators. However, the general expectation is that conditions will revive materially by May. In the meantime operations are far below normal and buying of pig iron and coke is small, mostly hand-to-mouth tonnages for quick delivery. Prices of these materials are unchanged.

Bars, Plates and Shapes

Decline in building activity has adversely affected the reinforcing steel market and local mills have closed only a few 100-ton lots since Jan. 1. Little business of importance is pending. Mill prices remain unchanged at 2.30c, with merchant bars quoted at 2.25c, demand being small.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Mill prices of plates are unchanged at 2.10c up, no recent business having given prices a real test. Seattle will open bids this week for a 24 and 36-inch pipeline involving 350 tons. The Puget Sound Machinery Depot, Seattle, has the contract to construct boilers for the Seattle and Richmond, Calif., Ford assembly plants, involving 100 tons of plates. No important projects involving plates have developed.

Contract for fabricating gates for the Rock Island, Wash., hydroelectric project dam has been awarded to the Puget Sound Machinery Depot, Seattle, involving 600 tons of structurals and 600 tons of plates. Pioneer Sand & Gravel Co. is building a mixing plant involving about 140 tons of structurals for 325 feet of conveyor galleries, a steel tower and a special design bulk material crane. Cowlitz county, Wash., will receive bids Feb. 24 for a 153-foot cantilever span and two 51-foot anchor arms. Bids have been submitted to the Puget Sound navy yard for furnishing 43 tons of structurals.

Pipe Inquiry Is Moderate

Seattle will receive bids this week for furnishing 3000 tons of cast iron pipe for East Eightieth street, consisting of 7300 feet of 42-inch and 2574 feet of 42-inch. For the Ford Seattle plant, the Pacific Waterworks Supply Co. has booked an order for 200 tons of 20 to 24-inch cast iron sewer pipe, while for the same project United States Pipe & Foundry Co., Seattle, will furnish 75 tons of fire pipe. The latter firm also has an award for 60 tons of 10-inch cast iron fire pipe for the torpedo station at Keyport, Wash. Bellingham, Wash., is in the market for 400 tons of pipe, alternate bids for cast iron and wood, while March 2, Yakima, Wash., will open bids for 389 tons of water main. Representatives of French manufacturers were low in bidding on 65,000 feet of 6 and 8-inch for Vancouver, B. C. Award is pending. Olympia, Wash., has received bids for furnishing a small tonnage of valves and accessories. Pacific States Cast Iron Pipe Co. was low on 50 tons of 4-inch cast iron pipe for Wapato, Wash. Agnew Hardware Co. has the contract for furnishing Everett, Wash., with a small tonnage of 6 to 12-inch steel pipe. Okanongan, Montesano and Waitsburg, Wash., are all in the market for municipal requirements.

Wire Imports Hurt Market

San Francisco—*(By Air Mail)*—While sales and inquiries were not particularly heavy this week a more cheerful tone prevails, and less weakness in the price structure is noted. Producers and sellers of wire products on the Pacific coast are somewhat alarmed over the heavy tonnage of foreign material being imported and are finding the situation hard to cope with. During the past year over 300,000 rolls of wire mesh were imported.

Bars, Plates and Shapes

Concrete bar bookings totaled 971 tons, compared with the weekly average for the year of 1288 tons. This brought the total to date to 9017 tons, as against 7077 tons for the corresponding period in 1930. The Concrete Engineering Co. took 300 tons for a school in Oakland, Calif., and an unnamed interest booked 300 tons for a newspaper building in Los Angeles. The Soule Steel Co. secured 200 tons for the Webster street pier, Oakland. Pending business exceeds 500 tons. Bids were opened on 240 tons for paving work in San Joaquin county, Calif. The University of California, Westwood, Calif., is taking bids on 300 tons for a dormitory. Out-of-stock prices continue to hold at 2.50c, base, on carload lots, in the Los Angeles and San Francisco districts.

Demand for plates was confined to small lots. No award has been made on 1300 tons for the Chelan pipe line. Bids have been opened on 750 tons for a ferry boat at Coronado, Calif. No change in quotations is noted, 2.05c to 2.15c, c.i.f., being general.

Awards of structural shapes aggregated 1855 tons, below the average weekly total. To date this year 15,700 tons have been placed, as compared with 16,257 tons for the same period a year ago. The Consolidated Steel Corp. booked 1100 tons for the *Times-Mirror* newspaper buildin gin Los Angeles. McClintic-Marshall Co. took 200 tons for an apartment in San Francisco, and the Pacific Iron & Steel Co. secured 100 tons for a postoffice in Santa Ana, Calif. The California Steel Co. was low on 150 tons for the Webster street pier, Oakland, and the Consolidated Steel Corp. was low on 250 tons for ring gates at Denver for the bureau of reclamation. No change in prices on plain material is noted, 2.15c to 2.25c being general.

Other Finished Material

Cast iron pipe awards were the second heaviest for any week this year and totaled 2597 tons, bringing the aggregate for the year to 9652 tons, compared with 15,116 tons for the same period last year. Los Angeles placed 2270 tons of 6 and 8-inch pipe with R. D. Wood & Co., and has opened bids on 2246 tons of 8 and 12-inch pipe. Newport Beach awarded 100 tons to an unknown company. Long Beach, Calif., is expected to place 2264 tons of 6 and 20-inch pipe within the next few days. Bids will be opened March 16 for 328 tons of 10 and 14-inch pipe for the improvement of Lomita Park district, Redwood City, Calif.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk	Gal.
⅛	58	44½	⅛	23	5
¼	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft. 55%
Selected lengths, 1 to 18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.....$37.00 to 38.00
Four-inch, Birmingham..... 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago..... 45.20 to 46.20
Six-inch and over, N. Y..... 37.50 to 39.50
Four-inch, New York..... 40.50 to 41.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia..	2.60c
Pittsburgh	2.75c
Portland	3.15c
San Frans. ..	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia..	2.60c
St. Louis	3.15c
Tulsa	3.65c

REINFORC. BARS

Baltimore....2.50c-	3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga..	3.10c
Cincinnati	3.15c
Cleveland ..2.25c-	2.44c
Detroit	3.00c
Houston	3.00c
Los Ang. cl....	2.40c
Los Ang. lcl..	2.70c
New York..2.65c-	3.10c
Phila. 2.40c-	3.00c
Pittsburgh	2.75c
San Fran. cl.	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young. 2.30c-	2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia..	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 8/16-in.	3.10c
Houston	3.00c
Los Angeles..	3.40c
New York(d)	3.30c
Philadelphia..	2.50c
Phila. floor....	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.50c
Boston	3.915c
Buffalo	3.50c
Chattanooga..	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)....3.00c-	3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	3.10c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev.***	3.75c
Detroit	3.75c
Los Ang.	4.70c
New York..3.50c-	3.65c
Phila.*†	3.60c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.35c
Seattle	4.50c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	5.45c
Buffalo 4.40c-	4.60c
Chicago (local del.)	4.35c
Chicago (outside)	4.35c-4.60c
Cincinnati	4.90c
Cleveland***..	4.35c
Detroit	4.25c
Houston	5.40c
Los Ang.	5.10c
New York....4.00c-	4.10c
Phila.*†	4.15c
Pitts.**	4.00c
Portland	5.00c
San Fran.	5.00c
Seattle	5.00c
St. Louis	4.60c
St. Paul	4.23c
Tulsa 4.60c-	4.75c

BANDS

Baltimore	3.50c
Boston 4.015c-	5.00c
Buffalo	3.50c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter....	3.30c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia..	2.90c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston 5.50c-	6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter ..	3.80c
New York	3.75c
Philadelphia..	3.15c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.70c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.40c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)....	4.75c
St. Paul (a)..	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 5½c extra, except Tulsa, where 5.14c is quoted.
(a) Rounds, hex. only.

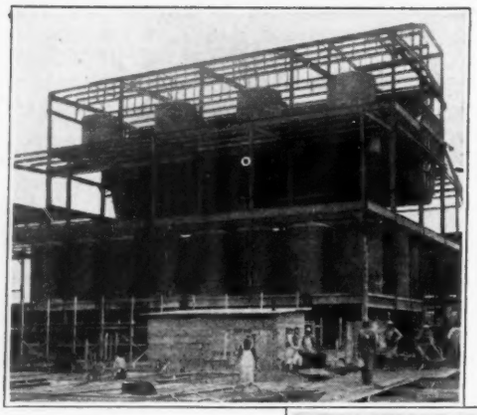
COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)..	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c).....	4.85c
New York	5.05c

(b)Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d)Minus quant. diff.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

TENNESSEE STEEL—

in SMALL TANKS



Thousands of tons of Tennessee Plates and Sheets are annually consumed in the manufacture of small storage and miscellaneous tanks. Adapted either to welded or riveted construction and furnished in all standard qualities and finishes, Tennessee products admirably fulfill the requirements of the tank builder.

Tennessee produces a full line of rolled steel products, including in addition to the above, structural shapes, bars, rails and accessories, in standard and special analyses.

US STEEL

Tennessee Coal, Iron & Railroad Company

General Offices: Brown-Marx Building, Birmingham, Ala.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES OF UNITED STATES STEEL CORPORATION:

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPB'LDG. & DRY DOCK CO.
ILLINOIS STEEL COMPANY
NATIONAL TUBE COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & RAILROAD CO.
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, Russ Bldg., San Francisco, Calif.
Export Distributors—United States Steel Products Company, 30 Church St., New York City

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 10.25c, Conn., for copper

Sheets	
Yellow brass (high)	17.37½
Copper, hot rolled	20.00
Lead, full sheets (cut ½c more)	8.50
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.25
Seamless copper	22.50
Rods	
Yellow brass (high, full turnings)	15.62½
Naval brass	16.62½
Anodes	
Copper, untrimmed	17.50
Wire	
Yellow brass (high)	17.87½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.00 to 7.25
Chicago	6.50 to 6.75
Cleveland	7.25 to 7.50
St. Louis	6.75 to 7.00
Heavy Yellow Brass	
New York	4.75 to 5.00
Heavy Copper and Wire	
New York	7.75 to 8.25
Boston	7.50 to 7.75
Chicago	7.25 to 7.75
Cleveland	7.25 to 7.50
St. Louis	6.50 to 7.00
Red Brass Borings	
New York	6.50 to 7.00
Yellow Brass Tubing	
Cleveland	4.50 to 4.75
Light Copper	
New York	7.00 to 7.25
Chicago	6.50 to 6.75
Cleveland	6.25 to 6.50
St. Louis	6.50
Light Brass	
Boston	3.50 to 3.75
Chicago	4.25 to 4.50
Cleveland	3.50 to 3.75
St. Louis	3.75 to 4.00
Zinc	
New York	2.00
Cleveland	1.50 to 1.75
St. Louis	2.00
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	8.50 to 9.00
Borings, Cleveland	4.50 to 5.00
Mixed cast, Cleveland	5.50 to 6.00
Mixed cast, Boston	4.00 to 4.50
Mixed cast, St. Louis	4.25

Secondary Metals

Remelt aluminum No. 12	11.00 to 12.00
Brass ingots, 85-5-5-5	10.00

Metals

Generally Firmer Price Tone Develops—Export Buying of Copper Active—Zinc Eases

New York — Nonferrous metal prices have been generally strong during the past week. Zinc has been an exception. The latter has eased off below 4.00c for prompt shipment. The tin market also lost much of its strength on profit taking when the curtailment plan was made more definite, but later recovered.

Tin shared with copper the center of attraction last week. Prices on the former went above 27.00c for the first time since early January. The further recovery in copper was due to continued large export business. Lead prices also went up slightly.

Domestic business in brass and copper products is improving slowly, mostly on specifications against old orders, as users contracted well for their needs when the copper fell to 9.50c last November.

Copper—Little domestic business was done a week ago at 10.00c and since then a little at 10.25c. Domestic users are well covered on requirements several months ahead but foreign users are not so well protected, and so they have been coming into the market for large tonnages almost every day. It is not believed that European consumption has shown any substantial improvement.

Zinc—With demand extremely light, only a little sales pressure has been necessary to put the prime western market for early shipment down to 3.95c, East St. Louis. Prices on shipment several months ahead, which had been holding above 4.00c, have come down to this figure. In addition to the effects of dull demand, the ore market is easy. The galvanizing market is slack and none too active demand for other zinc products such as brass and die castings, is reported.

Tin—Demand by consumers has been light, though consumption in tin plate and automobile factories in the past few weeks has increased. The price of spot Straits tin recovered from a little under 26.00c, to more than 27.00c, on account of the reluctance of sellers to do much business when they expected approval of the British government on the restriction plan.

Lead—With a little improvement in domestic demand and a substantial recovery in London prices, the New York price has been marked up ten points and the East St. Louis price five points.

Aluminum—A little improvement in business has been reported, but prices are unchanged.

Coke By-Products Easy; Better Demand Noted

New York—Distillate prices continue easy although in some instances there is an improved demand. Sales are noted at 19.00c for benzol and 28.00c for toluol but the market has not generally slipped back to these figures. Solvent naphtha and commercial xylol are steady at unchanged prices. Phenol is inactive with most sales at 16.00c. Naphthalene shipments are seasonally active. On spot business prices are easy.

On 32,000 pounds of naphthalene for United States marine corps, Philadelphia, the low bid was 3.5625c, although the majority of the bidders held to 3.75c, minimum, for flakes.

Coke By-Products

	Spot
Per Gallon, Producers' Plants, Tank Lots	
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.29
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.85 to $1.90

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Feb 18	10.05	10.25	9.75	26.70	27.00	4.50	4.30	4.00	22.90	7.05	35.00
Feb. 19	10.25	10.37½	10.00	27.10	27.37½	4.60	4.35	3.97½	22.90	7.05	35.00
Feb. 20	10.25	10.37½	10.00	27.25	27.62½	4.60	4.35	3.97½	22.90	7.10	35.00
Feb. 21	10.25	10.37½	10.00	26.60	26.87½	4.60	4.35	3.97½	22.90	7.10	35.00
Feb. 23—Holiday											
Feb. 24	10.25	10.37½	10.00	27.20	27.50	4.60	4.35	3.97½	22.90	7.05	35.00

Europe

European Markets Quiet—2000 Tons of British Ferromanganese Sold in United States.

London—(*By Radio*)—European iron and steel markets show little improvement. In Britain an encouraging feature is the fact steel output in January, as reported last week at 402,200 tons, was the first gain since last July. Railroad orders are being received from South America and South Africa, and it is believed domestic railroads are preparing to place large orders. Continental billets are offered at £4 7s 6d ($21.38), delivered, but British rerollers are overstocked.

Tin plate output is at about 50 per cent of capacity. Holland and Denmark are inquiring for tin plate. The market for galvanized sheets is dull, though demand from India is improving. Barrow sheet mills are busy. Shipments of Indian pig iron are making inroads in Scotland. A report from Middlesbrough states 2000 tons of ferromanganese has just been sold for delivery to the United States.

Conditions on the Continent continue unsatisfactory. Steel production in France still is falling. Prices are weak.

Belgian Market Feels Burden of Large Stocks

Brussels—Signs of improvement in the Belgian iron and steel industry which marked the end of 1930 have rapidly disappeared, and each week brings an increase of pessimism. Trade is reduced to the minimum, prices are falling, and depression is becoming general.

The pig iron market is influenced by accumulation of stocks in the principal producing countries, and by low offers made by certain furnaces. Prices fluctuate considerably in accordance with the importance of the business transacted. The Belgian foundry phosphorus pig iron syndicate has been prolonged for six months, dating from April 1. Semifinished steel is moderately active and some inquiry is received from Great Britain, but actual orders are placed only at the lowest prices and short periods of delivery. Merchant bar prices continue to fall, and a further drop of 1s (24c) has been registered during the current week, the present level being £3 18s ($19.20) f.o.b. Antwerp, which shows that prices again have dropped to the record low level of November, 1930.

Luxemburg 1930 Output Low

Brussels—The 1930 output of pig iron in Luxemburg was 14.88 per cent less than the output of 1929, which reached the record figure of 2,906,093 tons.

In 1930 the steel output of Luxemburg, including ingot sand castings, showed a decrease of 16 per cent on the 1929 output, which was the highest since the war and attained 2,702,457 tons.

French Output Near Record

Paris—Provisional statistics show that the production of iron and steel in France during 1930 was only slightly below the level of the record figures of 1929. It also is of interest to note that of all the European countries, France suffered the least from reduction of output.

The output of pig iron in 1930 is given as 10,100,000 metric tons, compared with 10,364,000 tons in 1929, a decrease of 2.53 per cent.

The output of steel ingots and castings in 1930 amounted to 9,402,000 metric tons, compared with 9,699,000 tons in 1929, a decrease of 3.05 per cent. Comparisons follow, in metric tons:

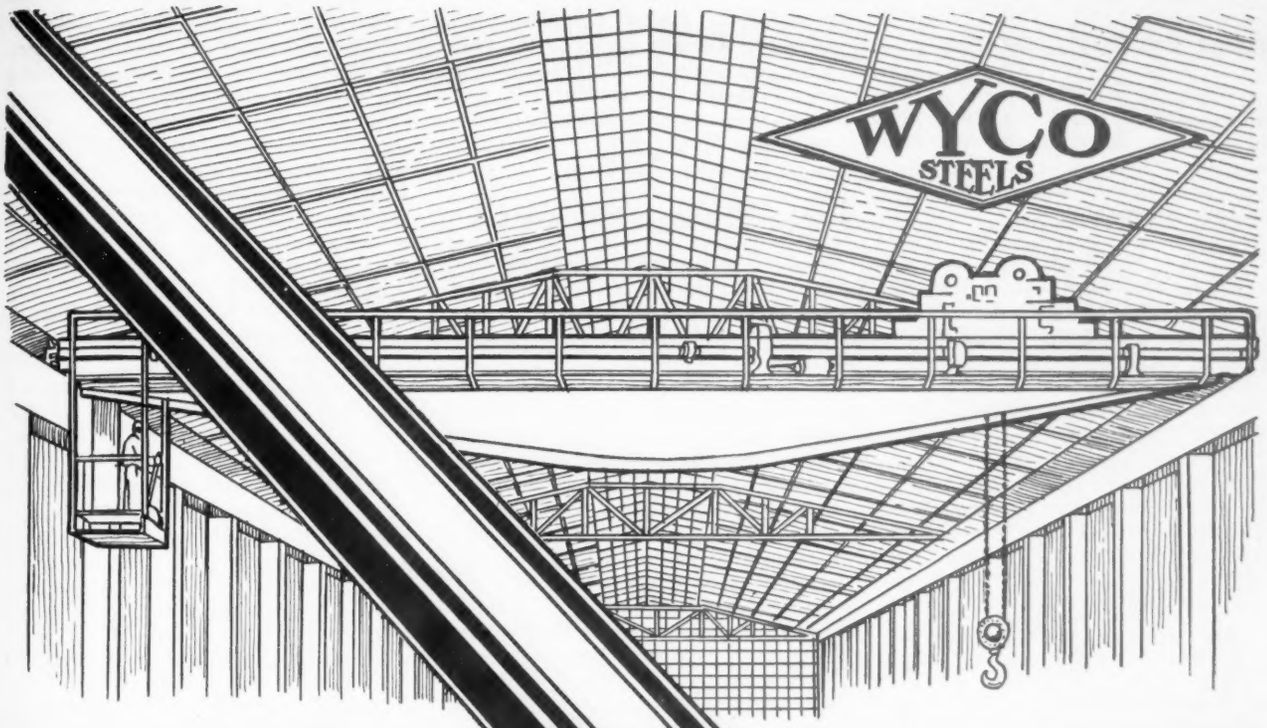
	Act. Fur. on Mon. ave.	last day	Pig iron	Steel ingots and castings
1913	131		433,940	390,580
1927	142		774,785	689,610
1928	153		841,415	782,995
1929	156		870,000	805,500
1930				
Jan.	156		875,000	800,000
Feb.	154		815,000	772,000
March	152		898,000	848,000
April	153		854,000	787,000
May	154		899,000	853,000
June	.....		841,000	753,000
July	147		861,000	790,000
August	143		845,000	775,000
Sept.	140		800,000	764,000
Oct.	139		827,000	797,000
Nov.	138		782,000	706,000
Dec.	138		800,000	756,000
Total			10,100,000	9,402,000

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 23	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f.o.b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3**.....	$14.22	2 18 6*	$12.64	2 12 0	$12.64	2 12 0	$12.15	2 10 0
Basic-bessemer.....	14.58	3 0 0†	11.91	2 9 0	11.91	2 9 0	13.37	2 15 0
Hematite, Phos. .02-.05	17.01	3 10 0	.....	.....	.....	.....	17.01	3 10 0
SEMIFINISHED STEEL								
Billets.....	$26.73	5 10 0	$16.77	3 9 0	$16.77	3 9 0	$17.50	3 12 0
Wire rods.....	41.31	8 10 0	29.16	6 0 0	29.16	6 0 0	29.16	6 0 0
FINISHED STEEL								
Standard rails.....	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars.....	1.68c	7 15 0	.86	3 18 0	.86	3 18 0	.87c	3 19 0
Structural shapes.....	1.68c	7 15 0	.78c	3 10 6	.78c	3 10 6	.79c	3 11 6
Plates.....	1.79c	8 5 0	1.00c	4 11 0	1.00c	4 11 0	1.05c	4 15 0
Sheets, black, 24 gage	1.90c	8 15 0	1.74c	7 18 0	1.74c	7 18 0	1.93c	8 15 0
Sheets, gal., 24 ga. corr.	2.44c	11 5 0	2.27c	10 6 3	2.27c	10 6 3	2.31c	10 10 0
Bands and strips.....	2.06c	9 10 0	1.00c	4 10 6	1.00c	4 10 6	1.01c	4 12 0
Plain wire, base.....	2.06c	9 10 0	1.13c	5 2 6	1.13c	5 2 6	1.18c	5 7 6
Galvanized wire, base..	2.39c	11 0 0	1.49c	6 15 0	1.49c	6 15 0	1.45c	6 12 0
Wire nails, base.....	2.39c	11 0 0	1.16c	5 5 0	1.16c	5 5 0	1.21c	5 10 0
Tin plate, box 108 lb...	$ 3.77	0 15 6	.....	.....	.....	.....	$ 8.26	1 14 0

Domestic Prices at Works or Furnace—Last Reported			French Francs		Belgian Francs		Renten Marks	
Fdy. No. 3 Pig Iron**	$14.22	2 18 6	$11.37	290(2)	$13.11	470	$18.54	78
Basic pig iron.....	14.58	3 0 0	12.74	325(1)	12.28	440	20.32	85.50
Furnace Coke.....	2.92	0 12 0	6.19	158	5.02	180	5.09	21.40
Billets.....	27.34	5 12 6	19.21	490	18.00	645	26.27	110.50
Standard rails.....	1.79c	8 5 0	1.41c	785	1.57c	1,210	1.36c	127
Merchant bars.....	1.68c	7 15 0	.97c	540	.93c	715	1.37c	128
Shapes.....	1.90c	8 15 0	1.12c	620	.92c	710	1.34c	125
Plates.....	1.95c	9 0 0‡	1.37c	760	1.09c	835	1.57c	147
Sheets, black, 24 gage	1.90c	8 15 0	2.33c	1,295	2.34c	1,800	1.25c	117
Sheets, gal. 24 ga., corr.	2.39c	11 0 0	2.80c	1,555	2.73c	2,100	3.53c	330
Plain wire.....	2.06c	9 10 0	2.16c	1,200	2.15c	1,650	2.21c	207
Bands and strips.....	2.06c	9 10 0	1.25c	695	1.27c	975	1.58c	148

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £16 9s 0d ($79.95) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.54) f. o. b.; **Silicon 2.50-3.00. British quotations are for basic openhearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.



SHAFTING

Standard and Special Analysis

COLD DRAWN

Turned and Polished

WYCKOFF DRAWN STEEL COMPANY

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Mills at:
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BOSTON—627 New C. of C. Bldg.
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CLEVELAND—Rockefeller Bldg.
BUFFALO—Ellicott Square
DAYTON—1128 The 3rd Nat'l Bldg.
MILWAUKEE—288 E. Water St.
PHILADELPHIA—133 So. 36th St.
DENVER—1037 U. S. Nat'l Bank Bldg.
MINNEAPOLIS—332 Builders Exchange

Chicago Office: 3200 So. Kedzie Ave.
Detroit Office and Warehouse: 6189 Hamilton Ave.

Pacific Coast Representatives: F. H. Currie, 309 Pacific Mutual Bldg., Los Angeles, Cal.

Beams From Broadway

(*Concluded from Page 25*)

hind schedule. It is likely, however, that more schools will be erected this year than last, at least a more promising start has been made during the first two months of 1931.

◆

The Empire State building, nearing completion, will be ready for occupancy probably by May 1. This structure now dominates the New York skyline and will probably continue to do so for some years to come. There is talk of 100-story structures, but they are still in the talking stage.

Proof of the pudding is in the eating, and Starrett Bros. & Eken Inc., builders of the Empire State, will move from their present headquarters on Park avenue and will occupy an entire floor in the new tower.

There is more steel and metal in this structure than there is in many small-size cities. An increasing tendency is noted in the use of steel and metals, other than structural steel, in large building projects.

Starrett Bros. & Eken Inc., the general contractors, were the central point of an organization which included more than 50 major sub-contracts. These in turn placed contracts for material and work to the number of about 3000. From Maine to the Gulf, and westward beyond the Mississippi contracts were placed for material entering into this building.

Structural steel totaling more than 55,000 tons was fabricated by American Bridge Co. and McClintic-Marshall Co. Post & McCord did the erecting in record time. Incidentally, the structural steel was furnished at $79 per ton, erected.

Mail Chutes Mile Long

There is a mile of mail chutes in the building, installed by the Cutler Mail Chute Co., Rochester, N. Y. This equipment is designed to meet the needs of 20,000 tenants. It was the largest contract of its kind ever placed, meeting the exacting demands of public use under post office regulation. These chutes are arranged in pairs, and by means of a device, which can be operated only by postal officials, the chutes may be closed on alternate floors, dividing the mail and reducing congestion. Should one chute in any pair need cleaning or repair, it can be closed throughout its entire length, the mail service continuing temporarily by means of the second chute.

Mail boxes are of aluminum and bronze richly ornamented and of special design. There are 396 openings for the deposit of mail. The mail chute system, like the elevators of which there are 68, is a modern device which adds to the rental value of the upper stories far above the street. There are eight Cutler mail chutes of the model F type. Bronze for the mail chute system was purchased from the American Brass Co. while the steel required was furnished by Follansbee Bros.

Large Tonnage in Heating

Under the sub-contract for heating, 50 producers of materials furnished pipe, radiators, sheet metal and other materials, Baker-Smith & Co. Inc. holding the general heating contract.

There are 6700 Murray radiators in the Empire State. These required 180,000 pounds of sheet copper, 70,000 pounds of seamless copper tubing, 16,000 pounds of cast iron fittings and 210,000 pounds of steel, the latter being used largely in the removable front panels for enclosures. The total square feet of radiation is 240,000.

Sheet metal under the heating contract was supplied by the Youngstown Sheet & Tube Co. and American Sheet & Tin Plate Co.; steel pipe, National Tube Co.; wrought iron pipe, Reading Iron Co., fittings, Crane Co.

◆

Six hundred tons of sheet and strip steel were used in the manufacture of the Empire windows. Sashweights alone weigh 450 tons and there are 130,000 feet of steel sash chain. Included also are 12,000 pounds of bronze in the manufacture of window hardware.

The National Sashweight Corp. supplied the weights; Wheeling Steel Co., the sheet and strip steel; American Sash Chain Inc., Bridgeport, Conn., the sash chain. The principal part of the hardware was manufactured by the H. B. Ives Co., New Haven, Conn., while the Artistic Bronze Co., Bridgeport, Conn., supplied the balance.

Deliveries still are being made on locks, latches, bolts and builders' hardware by P. & F. Corbin, New Britain, Conn., although up to the first of February, this company had already shipped 80,000 pounds of such material, of which 50,000 pounds was iron and steel, the rest being bronze and brass. The Corbin company purchased its material from the Stanley Works and the Milwaukee Stamping Co.

The Dahlstrom Metallic Door Co., Jamestown, N. Y., used 700,000 pounds of sheet steel in elevator hatchway entrances, 50,000 pounds of strip steel, 250,000 pounds of structural steel angles and 110,000 pounds of steel in fabrication of tracks and hangers for 66 elevators, there being 1175 hatchway entrances in the main building and 11 in the tower mast. There are 58 bronze hatchway entrances on the first floor, the bronze being furnished by the General Bronze Corp.

All steel hatchway entrances are equipped with Feralun sills, 170,000 pounds, from the American Abrasive Metals Co. Under the Dahlstrom contract, angles and shapes were supplied by the Bethlehem Steel Co., Carnegie Steel Co., and Seneca Iron & Steel Co.; sheets, American Rolling Mill Co. and Newton Steel Co.; tracks and hangers, Elevator Supplies Co., Hoboken, N. J.

◆

Interior doors in the Empire State were installed by the Metal Door & Trim Co., Laporte, Ind., sheets being furnished by the Newton Steel Co. and Wheeling Steel Corp., while strip for the same was supplied by the Acme Steel Co. and the Sharon Steel Hoop Co.

More than 100 subcontracts for work and materials were placed under the plumbing contract. Construction of this gigantic building also called for the construction of industrial railroad built by the Koppel Industrial Car & Equipment Co. The Union Iron Works, Hoboken, N. J., supplied eight steel working cages, two man and six material, designed and manufactured especially for this job. Six had a working load of 6800 pounds each and two a load of 3500 pounds each.

David Lupton's Sons Co. furnished 92 openings of windows and hardware in connection with the same, the weight of the windows approximating 29,395 pounds, fabricated from strip steel and steel sections in the company's Philadelphia plant. Under the Lupton contract, 2358 pounds of bronze mechanical operating devices were manufactured by Hugh S. Getty Co., Philadelphia, under Lupton patents.

Use Old Apartment Permits

Plans were filed for 84 apartment houses in Manhattan in 1930, compared with 290 in 1929 and 272 in 1928. Many projects for which plans were filed during the two previous years never went ahead. There was a rush in many cases then to get plans on file before the new building laws were operative.

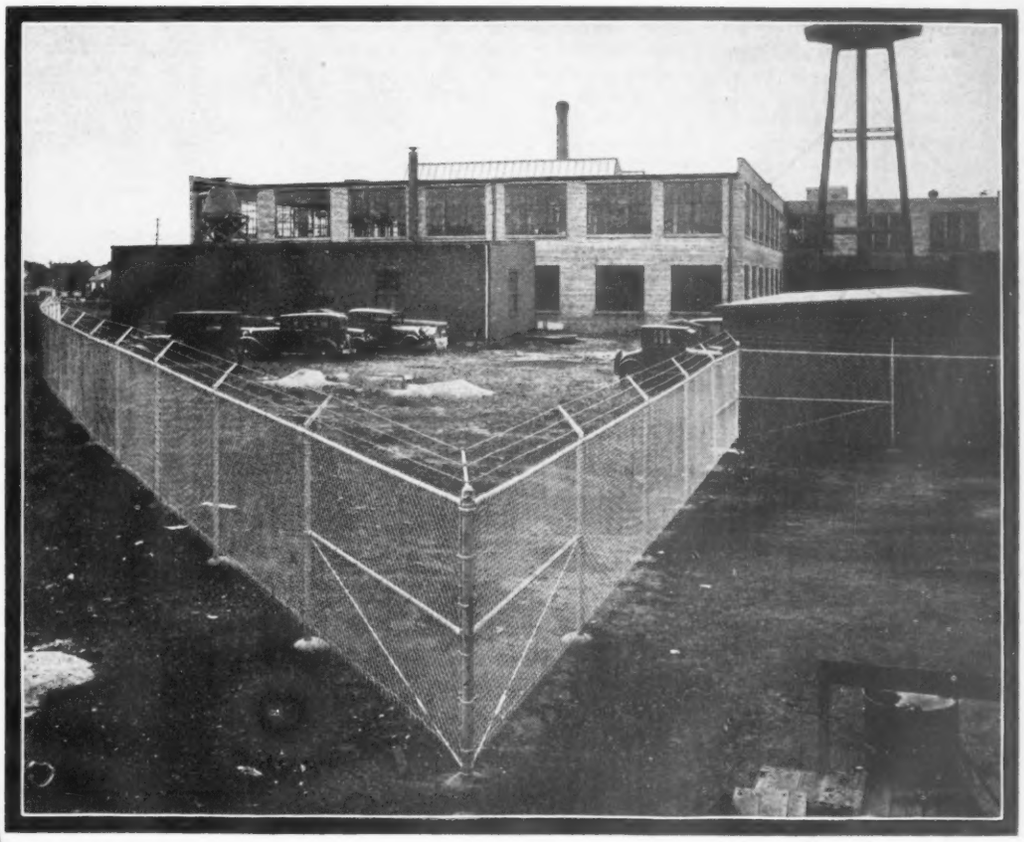
Also, a great deal of actual construction work last year was on plans filed in 1929. The largest apartment project was for a 25-story building at East Eighty-ninth stret and Ffth avenue filed by Rosario Candela, the architect.

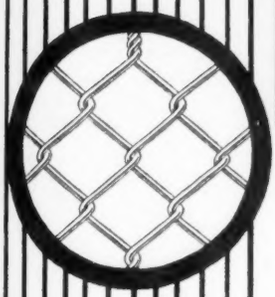
Steel was ordered during the year for the Majestic apartments which are larger, but plans had been filed in 1929.

The Henry Mandel interests and Bing & Bing were the most active apartment builders in Manhattan during 1930.

In all five boroughs, 507 plans for apartments were filed, many of them six stories, taking 100 tons or less of structural steel.

Your Property or Your *Neighbor's?*





OCCASIONALLY a small corner of your property may be forgotten through disuse. Being convenient and accessible to your neighbor, he inadvertently encroaches . . . and the property becomes his "by courtesy."

Enclose every foot of your ground in fence and avoid these embarrassing situations . . . Follow the property line. A fence will turn many a wasted corner into useful space.

Don't waste money on cheap, poorly-designed fences . . . Pittsburgh Chain-Link Fence will repay your investment through many years of satisfactory service with a minimum of maintenance. Made of copper-bearing steel throughout and heavily zinc-coated *after weaving*, it is doubly protected against rust . . . Framework is genuine Pittsburgh Seamless Steel Pipe of standard pipe weight, giving extra strength and durability to the erected fence.

Pittsburgh Steel Co.

760 Union Trust Bldg. Pittsburgh, Penna.

New York Chicago Detroit Dallas
Memphis San Francisco Syracuse

Pittsburgh Fence

CHAIN-LINK TYPE

Machinery

CONTINUATION of active inquiry without corresponding satisfactory orders indicates that the deadlock of manufacturing waiting for public demand while public demand is held in abeyance pending resumption of industrial activity, still is in force. The automotive industry has come the nearest to breaking this spell, but even there only cautious steps have been taken as yet, and no outstanding equipment orders have resulted. Nevertheless, optimism is maintained, particularly among machinery dealers, whose star appears to be in ascendancy. Competition of used machinery is felt keenly despite active promotion of new designs.

New York—Machine tool buying and inquiry continues to show spotty improvement, although most dealers and builders report the volume close to that of January. Orders are scattered and generally limited to one or two tools at a time. Two railroads, the New Haven and Delaware & Hudson, have about 25 tools still pending. Builders of grinding machinery note a gradual improvement in both orders and inquiry, and prospective buyers are insisting upon early deliveries. This is especially true of makers of automobile parts, who are reflecting increased activity at Detroit.

Demand for fixtures and parts is fairly active. The navy department and other government bureaus continue to inquire for equipment in fair volume, bids to be opened March 10 on six or eight tools of the heavier type. Ball bearing makers in southern New England continue to operate on erratic schedules.

Worcester, Mass.—Machinery production shows no tendency to increase, despite some renewed inquiry from scattered sections of the country. One lathe maker has closed three machines for New York and one for Russia and has pending inquiry for three more for navy yards on the Pacific coast. Brooklyn navy yard is expected in the market shortly. Meanwhile the government remains the most active purchaser.

Some machine tool inquiry is developing in central and southern New England. While this may indicate signs of renewed activity in the market, the fact remains that orders closed have been pending for from four to eight weeks. That leaves the market supplying a need that arose at the first of the year and this lack of aggressive buying is considered by many now to be the most formidable obstacle in the path of business improvement.

If all the inquiries now pending can be closed, they will serve to maintain the present production rate until spring, and by that time manufacturers expect that a general tendency to take advantage of improved sentiment will move the machinery market definitely upward.

For the time being, grinder manufacturers primarily are engaged in supplying the foreign market, as absence of live demand in the domestic field continues to be a prevailing condition.

Pittsburgh — Machine tool sales show little change, while inquiry is steady and fairly active. February sales to date are larger than a month ago and the outlook for the near future, based on the amount of active work scheduled for early closing, is fair. Awards and inquiry both are made up of a number of small items, and as yet no large lists are in prospect. On the whole, railroads in this district persist in their attitude of showing little or no interest in new equipment, and purchases by steel companies generally call for miscellaneous lots.

Cleveland—In spite of the improvement in production which has occurred here and there since the first of the year, the general employment situation has failed to improve up to this time. Authorities who are closely in touch with this phase of industrial affairs issued a statement this week to the effect that unemployment has in all probability reached its peak and that slow improvement should become evident about the first of April.

There is much diversity of opinion in Cleveland as to the state of the machine tool market. On the whole, dealers are inclined to be more positive in their declarations of improvement than are the machine tool builders. That is particularly true of dealers handling well diversified lines of nationally advertised equipment. There are strong indications that after a partial eclipse during years of prosperity, the reputable machinery dealer organization again is in the ascendency. Several machine tool builders who for several years have been maintaining extensive direct sales organizations, are reported to be negotiating with dealers with the idea in mind of resuming dealer distribution, either wholly or in part.

Considerable disappointment has been caused by the purchase of used machinery by companies who have confidently been cultivated as sure prospects on new and improved machine tools. Judging from the lists of used equipment which have come out since the first of the year, certain mergers and reorganizations have thrown a lot of comparatively modern tools on the market at rather attractive prices.

This condition more than ever justifies the unprecedented engineering activity carried on for the past several months and still being carried on by the machine tool builders, and it constitutes a distinct challenge to their advertising and selling ability. That this situation is realized by certain leaders in the industry is obvious from the new technique which is beginning to appear in their advertising—the economic appeal of new and improved tools to the industrial executive being stressed more strongly from more different angles than ever before.

Chicago — Several railroad purchases and a few scattered industrial sales constitute about all of the activity in the machine tool market during the week. Several outstanding industrial orders booked during the month brought the February totals of a few machinery houses slightly above January, but the majority of dealers' reports show disappointing declines for the month. Rumors of price concessions are heard from various districts, but in this district the volume of machinery business as yet does not justify much discussion of price. It is believed, however, that the development of important inquiry possibly might alter this condition. Chicago, Great Western railroad has purchased a 36-inch shaper, two 24-inch lathes, a 5-foot radial drill, and a hydraulic bushing press. Santa Fe will postpone purchase of machine tools now on inquiry until about the end of March. Burlington has added to its inquiries one for a 5-foot radial drill.

Machine tool inquiry in the Milwaukee district has been further enlivened. A conveyor builder has purchased a combination punch and shear, a road machinery builder will buy a list of tools about March 1, and a large electrical equipment manufacturer will have important inquiries for machine tools out about the same time. As this indicates, the market is far more active in the Milwaukee territory than it is in Chicago.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

CAMBRIDGE, MASS.—New Method Die Co., 30 Cross street, is reported to be in the market for two bench kick presses.

LYNN, MASS.—Campbell Bros., 99 Sagamore street, have been awarded contract, through the Hurley estate, for the reconstruction of a machine shop at 529 Union street, recently damaged by fire.

New York

NEW YORK—Consolidated Gas Co., 4 Irving place, proposes to erect a 3-story shop at a cost of about $350,000. Unit will be located at 500 East Sixty-third street. J. F. Hunter, care of owner, is architect.

NEW YORK—City department of parks plans to build a garage and shop at Bronx park and Birdall avenue, at a cost of approximately $125,000. J. Dusenbury, 2382 Grand Concourse, is architect.

NEW YORK—Ranco Realty Corp., B. Alpren president, 527 Tiffany street, is having preliminary plans prepared for construction of a 1-story shop at Tiffany street and East Bay avenue. Building will be 100 x 100 feet. Cost is estimated at $40,000. N. Rotholz, 155 East Forty-second street, is architect.

NEW YORK—Jones & Larson Corp., Grand street and Furman avenue, Maspeth, L. I., advises through George C. Jones that a shop, 100 x 100 feet, is now being erected. Additional machinery will be purchased, but type has not been decided upon, decision probably being delayed until next summer. Company fabricates and erects industrial buildings. (Noted Feb. 19.)

ROCKVILLE CENTER — United States Mayflower Burner & Fuel Corp. has been incorporated with $150,000 and 5000 common shares by R. B. Ostrander, to deal in appliances and materials.

SYRACUSE—Austin Mfg. & Sales Corp. has been incorporated with $750,000 capital by Searl & McElroy, to manufacture and deal in heating and ventilating devices.

Pennsylvania

PHILADELPHIA—Bureau of supplies and accounts, navy department, Washington, will receive bids until March 3 on schedule 5154 for two duplex motor-driven milling machines.

New Jersey

HOBOKEN—United Combustion & Engineering Co. has been incorporated with $100,000 and 11,000 common shares by Stuhr & Vogt, 68 Hudson street, to deal in machinery.

Ohio

AKRON — University of Akron, George F. Zook president, will start construction this spring, to be completed next fall, of units for the university's aeronautics institute. Tentative plans have been completed for the buildings, which will be erected at Akron municipal airport. Included will be shops for the construction of model airships and airship structural equipment, and testing laboratories. Laboratories are to be directed by Dr. Theodore von Karman.

ASHTABULA — Battery Sales & Service Station is in the market for an electrical test bench lathe and electrical equipment.

ATHENS—City council is considering erection of a municipal light and power plant, to be erected at an approximate cost of $100,000.

CANTON—Union Metal Mfg. Co., 1432 Walnut avenue southeast, has let contract to the Hiner Structural Steel Co., 332 Second street, northwest, for a 1-story, 60 x 340-foot plant, to be built on Maple avenue northeast. Cost, approximately $40,000. Company manufactures steel lighting posts and trolley poles.

CINCINNATI—City officials of St. Bernard, a suburb, are considering installation of new equipment in the municipal light and power plant. A 750 or 1000-kilowatt generator unit and a high pressure boiler may be required. Survey has been ordered by the council.

CLEVELAND — Allied Printing & Binding Machinery Inc. has been incorporated with 500 no par shares by Charles M. Lemmon, 931 Society for Savings building.

CLEVELAND—Jackson Dish Washer Inc., O. V. Jackson manager, Fidelity building, recently organized, will develop production of dish washing machines. Initial operations are being handled by the Metal Spinning & Mfg. Co., 2005 Rockwell avenue.

CLEVELAND—Weaver Bros. Co., manufacturer of acid-resisting baskets, racks, and other metal pickling plant equipment, with headquarters in Adrian, Mich., will be moved here for a consolidation with the H. J. Bowie Co., structural steel fabricator.

COLUMBUS — Miller Machine & Mold Works, 705 Ann street, has a building permit for alterations to its plant, to cost about $2,200. Second floor is to be extended by a section 26 x 36 feet. H. F. Blocker, 104 Sixteenth avenue, is contractor.

COLUMBUS—Vorys Bros. Inc., 215 East Russell street, will receive bids until June 23 for construction of a 1-story shop and warehouse, 100 x 138 feet, to be erected at Goodale and Kerr streets. Carmichael & Millspaugh Co., 5 East Long street, is architect.

DAYTON — Hohman Plating Co., Second and Taylor streets, is planning erection of a $100,000 plant, 60 x 140 feet, three stories. W. J. Huhn, 204 McClure street, is architect.

SPRINGFIELD—M. & H. Tool Co. Inc. has been incorporated with 250 no par shares by Bowman & Hodge, 916 First National Bank building, to deal in tools.

TOLEDO — Hudson-Burtscher Inc. has been incorporated with 250 no par shares by Sharon J. Hudson, Trilby, O., and A. Burtscher, 3702 Revere drive, to make tools.

Indiana

ANDERSON—City has plans for the improvement of the municipal light and power plant. Installation of a boiler is included. Cost is estimated at $50,000. H. Gwinnup is engineer.

FT. WAYNE—Board of public works has closed bids for construction of waterworks improvements, to include pumping stations. Approximate cost of the project, $150,000. Hood, Decker, Shoecraft & Drury, Ann Arbor, Mich., are architects.

RICHMOND—City council is considering improvements and extensions to the municipal power plant. Approximate cost, $850,000.

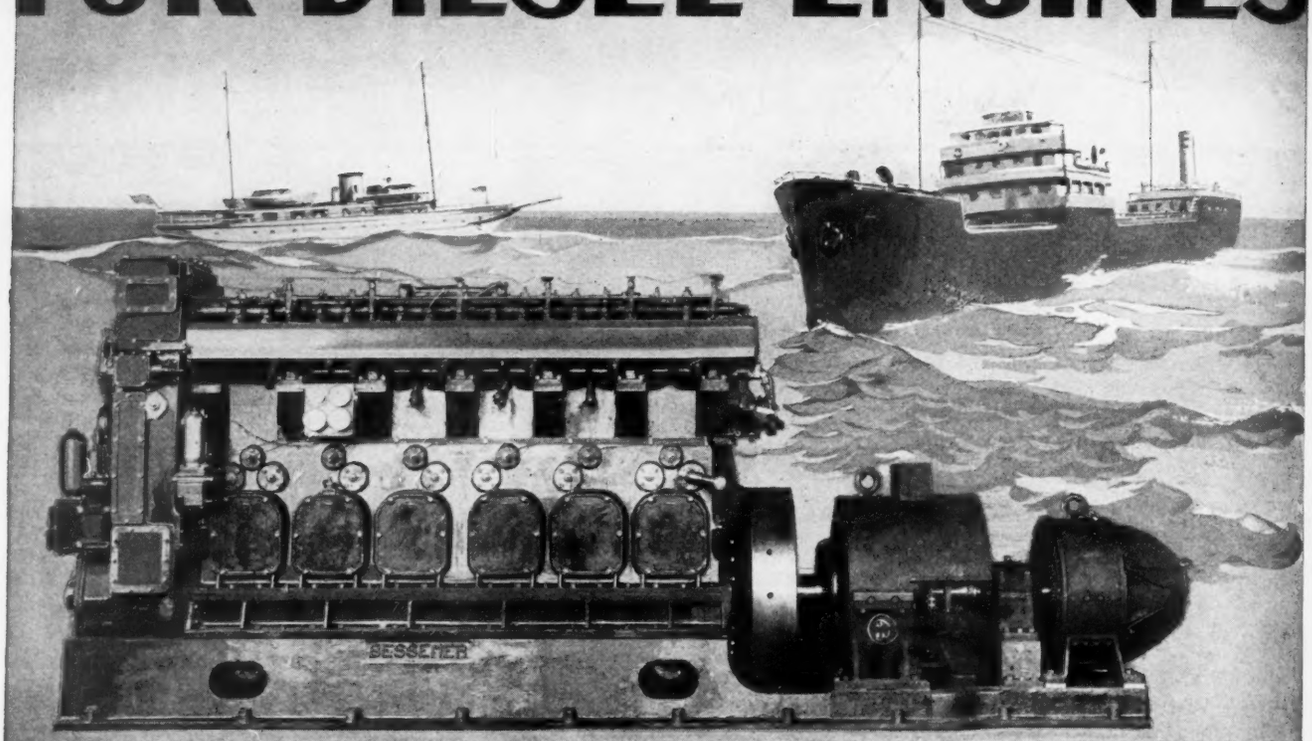
Michigan

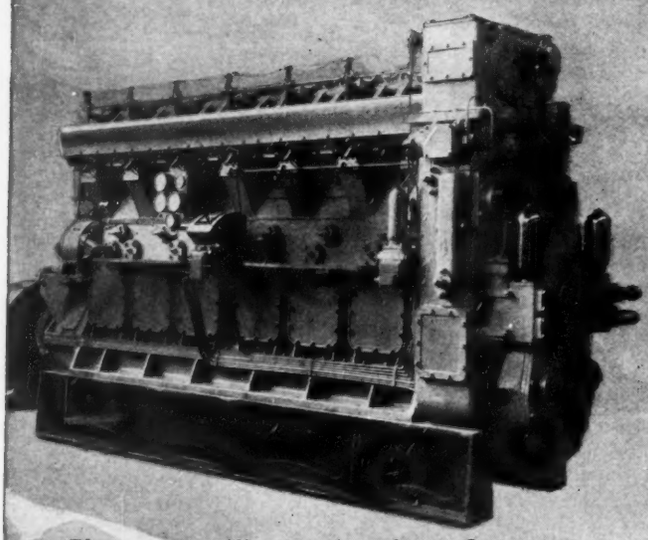
BAY CITY—Industrial Brownhoist Corp., recently noted as discontinuing its Cleveland plant for the concentration of operations here, has awarded contract to the Henry C. Weber Construction Co., Bay City, for the construction of a plant extension of 60,000 square feet. Shop facilities will be included. Construction is to be completed and consolidation of operations effected by July 1. Cost of transfering Cleveland activities and construction of the extension is estimated at $200,000. (Noted Jan. 22.)

CEDAR SPRINGS—John C. Truesdale has started operation of a foundry in a plant on Muskegon street. Company will be known as Cedar Springs Aluminum Foundry.

DETROIT—Stinson Aircraft Co. has let contract to H. G. Christman-Burke

FOR DIESEL ENGINES





The upper illustration is a Cooper-Bessemer Diesel engine-generator unit for the tanker "Tidemotor" of Tidewater Oil Co. The lower picture, another Cooper-Bessemer unit in the private yacht of Mr. George L. Craig, Long Beach, California.

Engineers and designers find, in NORMA-HOFFMANN Precision Bearings, those rugged qualities which heavy-duty engine service requires — load-ability, speed-ability, shock-ability, depend-ability. The Cooper-Bessemer Corporation, Mount Vernon, O.— builders of the Diesel units shown here — are using PRECISION Bearings (Ball, Roller and Thrust) in engines of this type, for wedge shaft, governor, governor control stand, spray valve, and other purposes. It is simply a matter of adding measurably to the safety factor of the engine as a whole, by providing extra-assurance against bearing trouble. You may have a bearing problem. Let our engineers help. Write for the catalogs.

"NORMA-HOFFMANN"

PRECISION BEARINGS

BALL, ROLLER AND THRUST

NORMA-HOFFMANN BEARINGS CORPN.- STAMFORD CONN. U.S.A.

Co. for erection of a 2-story extension to its plant in Wayne, a suburb. Cost is estimated at $25,000.

DETROIT—Aerio Coal Burner Inc., with offices at 854 Michigan Theatre building, advises through Clarence B. Keemer, president, that the company is entering production of a coal burner which utilizes coal screenings. Plans concerning plant facilities have not been definitely arranged. (Noted Feb. 12.)

KALAMAZOO — Roamer Corp., 401 East South street, has been incorporated with $50,000 capital by A. C. and M. A. Barley, to manufacture automobiles, airplanes and parts.

PALMER—Pioneer Mining Co. has been incorporated with 1000 no par shares by Elton Hoyt, 11020 Magnolia drive, Cleveland, to mine, produce and deal in iron ores.

Illinois

BELLEVILLE—Smelter room at the plant of the Roesch Enamel Range Co., Twenty-fourth and Main streets, recently was damaged by fire. Loss is estimated at $27,000.

CHICAGO—Mall Tool Co., 7740 South Chicago avenue, has purchased a 3-story plant it now occupies and an adjoining site, 130 x 183 feet. Erection of a plant addition is being considered.

CHICAGO—All Steel Press Co., 847 West 120th street, has been incorporated with $10,000 capital by Samuel C. Horwitz, 111 West Washington street, to deal in press machinery.

CHICAGO—Boduwil Co., 105 West Madison street, has been incorporated with $50,000 capital by Lambert H. Hayes, 105 West Madison street, to manufacture and deal in sales registers.

QUINCY—Board of education, W. E. White secretary, Musselman building, has set Mar. 15 as new date for receiving bids for a school to be erected at Fourteenth street, between Maine and Jersey streets, to include a machine shop. Cost of the project is estimated at $1,300,000. J. D. Chubb, 109 North Dearborn street, Chicago, is consulting architect and Behrensmeyer & Haffner, Western Catholic Union building, are architects. (Noted Sept. 11.)

ROCKFORD — Wells Body & Fender Works Inc. has been incorporated with $10,000 capital by Shelby B. Hood, Forest City National Bank building, to manufacture auto parts.

Southern States

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids until March 10 for one sensitive bench drill, on schedule 5187, and for one power brake bending machine, on schedule 5188.

WASHINGTON—Department of commerce, bureau of lighthouses, airways division, proposes to erect air communication stations at Little Rock, Ark., Birmingham, Ala., Shreveport, La., Jackson, Miss., Jacksonville, Fla., Eutawville, S. C. and Amarillo, Tex. Stations will require power equipment and towers. H. J. Walls is airways radio engineer.

PENSACOLA, FLA.—Bureau of yards and docks, navy department, Washington, as a part of development at the naval air station here, will expend approximately $150,000 for extension of shop and hangar buildings. (Noted Nov. 20.)

NEW ORLEANS—City council proposes to erect a 3-story industrial college at a cost of about $500,000. W. R. McCornack, 10006 Carnegie avenue, Cleveland, is architect.

SHREVEPORT, LA.—May Trailers Inc. has been incorporated with $250,000 and 4000 no par shares by H. B. May, president and manager, to manufacture truck trailers.

HAMPTON ROADS, VA.—Bureau of yards and docks, navy department, Washington, proposes to erect hangar and shop units here. Bids for construction will be opened March 11.

HOPEWELL, VA.—Swanson Aircraft Co. Inc., manufacturer of airplanes, advises through E. W. Freeman that all needs recently noted have been filled except for a nibbler, lathe and portable sander, which will be purchased within 60 days. (Noted Feb. 12.)

MARTINSVILLE, VA.—Turner-Bowles Corp. has been incorporated with $25,000 capital by W. R. Broadus Jr., to manufacture engines and appliances.

NORFOLK, VA.—Bureau of yards and docks, navy department, Washington, has plans for boiler shop additions for the navy yard here and for hangar and shop extensions at the naval air station here, the latter to cost approximately $150,000.

Missouri

KANSAS CITY—Long Haul Scraper Co. has been incorporated by William List, 328 Benton boulevard, to make implements.

KANSAS CITY — Oval Compass Co. has been incorporated by Luther F. Duby, 840 Armstrong street, to deal in devices.

ST. LOUIS—Artistic Metals Mfg. Co. has been incorporated with $50,000 capital by Joseph W. Schrader, 208 North Broadway, to manufacture metal products.

ST. LOUIS—Concrete Transport Mixer Co., 650 Rosedale avenue, advises through T. H. Fleming, president, that the company has leased a plant and has secured machinery. Paul Marvin is manager. Company is engaged in the manufacture of a concrete mixer which is applied to truck chassis. (Noted Feb. 19.)

Oklahoma

MEDFORD—City is having preliminary plans prepared for a new light and power plant, to be built at a cost of about $25,000. Engineer is to be selected.

Texas

ALPINE—Pecos Valley Gas Co., Artesia, N. Mex., will build a booster station in connection with a new gas line to be laid from Pecos Valley field to Alpine and Marfa, Tex. Otto Staerke is general superintendent in charge. Compressors and auxiliary equipment will be purchased.

BEAUMONT—B. & A. Welding & Machine Works has been incorporated with $10,000 capital by George E. Bryant, 1263 Liberty street, to operate a machine shop.

DALLAS—Magnolia Petroleum Co. will build a 70-mile oil line from Kilgore field in eastern Texas to its trunk line near Center, Tex. According to D. C. Stewart, manager of the pipeline department, one pump station with two 10,000-barrel pumps will be installed, equipment to be furnished from company's stock.

FT. WORTH—National Vego Gas Corp., 4609 Camp Bowie boulevard, Homer L. Baughman secretary, proposes to erect an addition and install equipment for making sheet metal products.

LIBERTY — Texas-Louisiana Tool Co., L. Peveto president, advises that contracts have not yet been signed for a machine shop proposed here, but action may be taken soon. (Noted Jan. 15.)

Wisconsin

LA CROSSE—General Instrument Co., Front and Market streets, advises through A. H. Zischke, manager, that the company is not considering erection of a plant or addition.

MANITOWOC—Board of education has instructed William J. Raeuber, 926 South Eighth street, to prepare revised plans for a vocational school. Appropriation amounts to $200,000.

MILWAUKEE — Metropolitan sewerage commission, Jones island, is asking bids until March 9 on two 2500-gallons per minute centrifugal pumps, motor operated and float controlled, for the new sewage booster station at Port Washington and River roads.

WEST ALLIS—Pioneer Mfg. Co., 726 Seventy-fourth avenue, manufacturer of molding machines, power transmission devices and other equipment, has let contracts for erection of a 1-story shop addition, 34 x 74 feet.

Nebraska

OMAHA—American Smelting & Refining Co., Fifth and Douglas streets, has let contract to Busk Construction Co., 501 Sunderland building, for a

smelter building, estimated to cost $35,000.

Colorado

DENVER—Curtiss-Wright flying field is building a repair shop to replace one recently damaged by fire. Unit will be 36 x 48 feet.

Nevada

LAS VEGAS—Southern Sierras Power Co., Riverside, Calif., plans to build a power substation here for the Hoover dam project, at a cost of about $250,000.

Arizona

KINGMAN—Glenidick Mines Corp., H. Derrer manager, proposes to erect a mill here with capacity of 50 tons.

Pacific Coast

CARPINTERIA, CALIF.—W. C. Smith Jr., manager of airport, will construct a new hangar unit and add equipment.

GRIDLEY, CALIF.—City council has rejected bids for a diesel engine unit.

SACRAMENTO, CALIF. — Automatic Steel Door Corp. has been organized here by William Alderson, E. R. Winn and William Luard, to manufacture steel fire doors for garages, warehouses and hangars.

SAN JOSE, CALIF. — John L. Knorpp plans erection of a new hangar at the municipal airport.

ROSEBURG, OREG.—City council, airport commission, has plans for construction of a hangar unit at the municipal airport.

LA CONNOR, WASH.—City council will expend about $45,000, as provided by a recent bond issue, for improvements to the water system, plans to be completed in two months. A 200,000-gallon reservoir and 25,000 feet of pipe are included. W. C. Morse, engineer, Seattle, is in charge of plans.

SEATTLE—Department of highways, Olympia, Wash., advises through Samuel J. Humes, director of highways, that contract for a shop building recently noted as let was for foundations only. Building contract will be let later for a shop building, 65 x 199 feet, and an office unit. Matters concerning equipment and machinery have not been decided. (Noted Feb. 12.)

Dominion of Canada

CHATHAM, ONT. — City engineer will purchase pumps in connection with a waterworks project.

HAMILTON, ONT.—Municipal Incinerator Co. Ltd. has been incorporated with 4000 no par shares by Orville M. Walsh, to erect and install incinerator plants.

HAMILTON, ONT.—Municipal machine shop, recently noted as planned, is under construction. Additional facilities are being provided for a craneway, 25 x 85 feet. Equipment from the former shop is to be moved to the new unit, which will be 50 x 240 feet. Purchase of additional items is under consideration. S. H. Kent is city clerk. (Noted Dec. 4.)

PEMBROKE, ONT.—D. D. Terrill Saw Co., Bangor, Me., is establishing a branch plant here, to be managed by K. M. Smith, for the manufacture of saws and saw tools.

MONTREAL, QUE.—City engineer has awarded contracts for construction of an incinerator, foundations for which are being laid. Estimated cost, $200,000.

MONTREAL, QUE.—Dominion Hoist & Shovel Co. Ltd. has been incorporated with 5000 no par shares by F. G. Bush, 856 Maplewood avenue, to manufacture and deal in excavating machinery.

MONTREAL, QUE.—Oil Elec-Tric Engineering Corp. of Canada Ltd. has been incorporated with $50,000 capital by Rene Chenevert, 2090 Sherbrook avenue west, to manufacture and deal in oil burners and electrical devices.

New Trade Publications

ALUMINUM—Williams & Co. Inc., Cleveland, in a leaflet calls attention to its facilities for immediate delivery of aluminum and aluminum alloys in whatever form the user requires it.

AIR FILER—Madison-Kipp Corp., Madison, Wis., in a current bulletin announces addition of an air filer to its line of pneumatic tools. The bulletin also presents other lines of tools and equipment supplied by this company.

ELECTRIC FANS—Wagner Electric Corp., St. Louis, in Bulletin 168 announces addition of several new fans to its line. These include two non-oscillating fans and two new ceiling fans.

HAND TRUCKS—A circular by the Illinois Iron & Bolt Co., Carpentersville, Ill., announces a new midget truck for materials handling, with illustrations of the truck and its uses.

ALUMINUM — Aluminum Co. of America has issued a booklet on aluminum for truck bodies. It contains operating and weight-saving data on truck bodies of aluminum, a section on the design and manufacture of aluminum truck bodies and a profusion of drawings and halftones to illustrate the text.

SLIP RING MOTORS—Wagner Electric Corp., St. Louis, has issued bulletin No. 169, devoted to slip ring motors. It discusses in detail the mechanical and electrical characteristics of these motors, ability to start smoothly with low current draw on heavy loads, the four types of this class of motors, speed torque characteristics and the control equipment necessary for starting.

SMOKE RECORDER—A smoke recorder in service in a large power plant is the subject of a circular by the Leeds & Northrup Co., Philadelphia. It describes and illustrates application of this device to determination of smoke conditions in the stack as a measure of efficiency in firing.

PIPE BENDING—Bulletin No. 50 on the practice and theory of bending wrought iron pipe, has been issued by the A. M. Byers Co., Pittsburgh. It calls attention to important points that demand attention in successful bending, with an explanation of what happens in the pipe during the bending operation and how successful results may be obtained.

FEED WATER REGULATOR—Atlas Valve Co., Newark, N. J., has issued a booklet on the Campbell feed water regulator. It describes the different principle on which this regulator works. Recent changes in boiler room practice have caused changes to be made in this device. The booklet illustrates methods of applying the regulator under various conditions. A parts list and a complete list of control valves of various designs are included.

TRAMRAIL—Application of tramrail to the washing of windows and building exteriors is the text of a bulletin by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O. With this installation the entire surface of a building can be reached safely and without delay in moving rigging. Illustrations show its application.

THERMOCOUPLES—Two new thermocouples, one for molten brass and the other for molten aluminum, are described in an illustrated folder and bulletin from the engineering development department of the Brown Instrument Co., Philadelphia. Construction features and operation are outlined. Illustrations are given of typical applications in nonferrous foundries. A cooling curve of molten aluminum is a part of the engineering data included.

ELECTRICAL EQUIPMENT — Century Electric Co., St. Louis, in bulletin No. 41 presents its line of alternating and direct-current fans, illustrations showing construction of each type and applications to various kinds of service. Leaves for its catalog have been prepared on an inverted rotary converter and an emergency lighting system for automatically supplying light when the regular source fails.